THE IRON TRADE REVIEW

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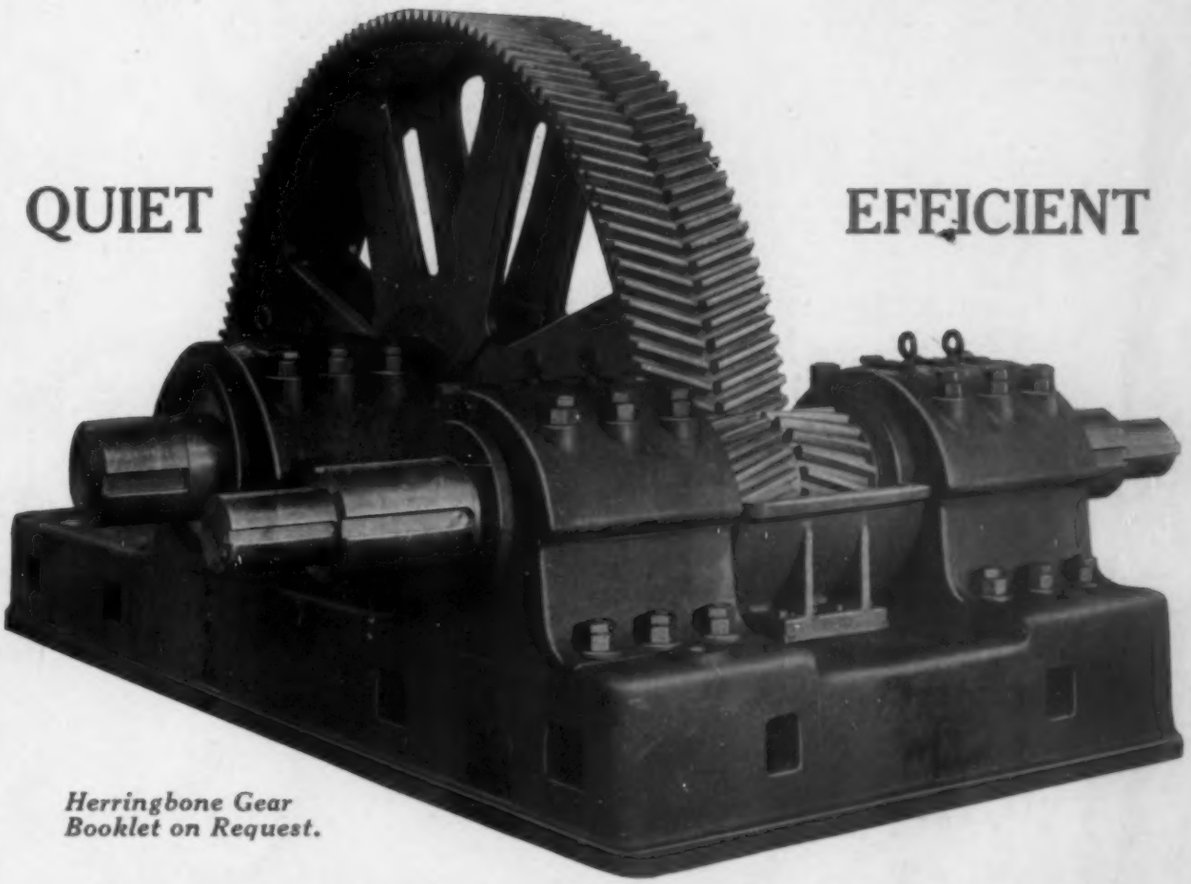

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FAWCUS MACHINE COMPANY - Pittsburgh, Pa.

Advertisers' Index, pages 148-149. Contents, page 63. "Where-to-Buy," page 72.
Engineering Directory, pages 116-117. Classified Advertisements, pages 125-147.

War Materials

A By-Product Coke Plant is of great value in producing war materials. From every ton of coal carbonized in a Koppers By-Product Coke Oven there is recovered—

Coke for making iron
Gas for making steel
Tar for fuel, drugs, dyes, etc.
Ammonia for nitric acid and fertilizers
Toluol for high explosives
Benzol for drugs, dyes, explosives, motor fuel, etc.

A Koppers By-Product Coke Plant will produce high grade metallurgical coke and high yields of these important products.

H. KOPPERS COMPANY

PITTSBURGH, PENNSYLVANIA

BUILDERS OF BY-PRODUCT COKE PLANTS

THE IRON TRADE REVIEW

Vol. LXII Cleveland, January 31, 1918 *No. 5*

Plants Keep Up Traffic Struggle

Production Continues Far Below Normal as Unfavorable Weather Conditions Retard Relief—Pig Iron Selling for Last Half More Expansive—War Buying of Steel Products Again Running Large

SEVERE weather conditions again have intervened to minimize the beneficial effects on the iron and steel industry of the nation-wide effort to re-establish adequate transportation service. Evidences of improvement are decidedly spotty. The worst conditions in many years of river traffic at Pittsburgh have strongly combined with the rail congestion to prolong the heavy loss of production in that district. Snow drifts in the Allegheny mountains have cut off the Connellsville coke region from many blast furnaces. It is estimated officially operations of open-hearth plants in the Greater Pittsburgh and valley districts last week were at 59 per cent of capacity and blast furnace and coke oven production was at 66 per cent. Eastern plate mills have been running 50 to 75 per cent full. Leading eastern Pennsylvania steel companies report shipments of finished products in January have been 50 per cent of those of December. Unfilled orders have increased accordingly.

Basic Needs More Acute

While production of merchant pig iron on the whole has improved, restrictions on shipments remain severe. As a result, various furnaces have been piling iron of which consumers are in feverish need. The steadily growing shortage in basic iron for shipment by July is being emphasized by the recent operating difficulties of the producers. It is estimated 200,000 tons of unsatisfied inquiry virtually is going begging in Ohio and Pittsburgh territory. Eastern buyers also are seeking this grade in vain. The result has been a stimulation of last half buying. As manifesting the anxiety of consumers to build up a dependable source of supply, a new northern Ohio works has placed its last half requirements in the Chicago territory. Following the adoption of a satisfactory form of contract to cover the provision for later governmental revision, Chicago producers have begun to sell heavily for last half. A New York state maker who is credited with having booked 100,000 tons for last half has withdrawn. Valley and lake interests which have booked over 200,000 tons recently for delivery after July continue to take business.

Uncertainty in Manganese

A far-flung effect of the coal stringency is found in the serious turn in the Brazilian manganese ore situation. The recent governmental suspension of transportation from the mines to seaboard because of the shortage of fuel, has been followed by the mandate to interests in this country not to load ore purchased on contract because sufficient mineral is not at shipping port. With the relatively insufficient Cuban production committed for this year and Indian imports not to be counted on, the foreign ore supply is in doubt. The uncertainty of the situation is being reflected by a stiffened market in ferromanganese. The government has refused to license exports of this metal. It is within the possibilities that a limitation may be imposed on makers to produce 40 to 60 per cent metal in order to utilize the low grade domestic ores.

War Buying is Active

Another wave of war buying appears to be coming on in finished materials. The Emergency Fleet corporation has made a number of additional allotments including 20,000 tons to an eastern interest and is about to come into the market for 600,000 to 700,000 tons additional of plates, shapes and bars, according to reliable authority. About 25,000 tons of structural material are wanted by the government for aeroplane and army buildings in France. December's record of 114 per cent bookings in fabricated steel reflects the heavy orders which the government recently has been placing. Great Britain is inquiring for 50,000 tons of shell steel. A notable export order closed calls for 12,000,000 carriage bolts or 9000 tons for military purposes.

The Iron Trade Review

EDITORIAL

Open-Minded Attitude Wanting

LESS legislation but more investigation is coming to be the function of congress as a result of the broadened field of government activity. This necessary province of our lawmakers is undisputed. Legislative inquiry should be exercised with diligence at this time when such tremendous sums are being applied toward defeating Germany. But investigations should be fair and should be entered upon with a mind open to conviction, free from personal animosity or political bias since otherwise constructive results are impossible.

Such a composite state of mind as is ascribed to the able jurist, assumed by the chronic debater and thrust upon each voter accepted for jury service, is attained with difficulty. The element of personal animosity is not displayed so frequently as are evidences of a firm conviction of the fault or shortcoming of the investigated. Real statesmen as well as congressmen of more ordinary attainments exhibit this weakness. The senate investigation of the Emergency Fleet corporation was conducted by the committee on commerce, which includes some of the ablest men in public life. But witness the following extract from the formal report:

SENATOR NELSON:—And you had no experience in the construction of vessels before you became a member of this corporation?

MR. PIEZ:—Not in that sense; no. I had large experience in the construction of large engineering works—works of considerable magnitude.

SENATOR NELSON:—But not in shipbuilding?

MR. PIEZ:—No; not in shipbuilding.

SENATOR NELSON:—And you do not know anything about it except what you have acquired lately?

MR. PIEZ:—No.

SENATOR NELSON:—Well, do you not think it would be advisable to have a practical shipbuilder occupy a position like yours—a man who is versed in shipbuilding instead of a man who has run a *belt line?*

MR. PIEZ:—Well, pardon me, Senator—

SENATOR NELSON:—It is rather personal, but we are after expert opinions.

This extract is not given to embarrass Senator Nelson, who is capable and usually broad minded. Nor is it intended to draw attention to Mr. Piez, the vice president of the Emergency Fleet corporation, who was formerly president of the Link-Belt Co. But the atmosphere of the average congression investigation here is reflected. Business men of superior attainments, particularly those who are giving their best talents to the government at this time, should be entitled to an unbiased hearing before any investigating body. Congressional committees too often make assumptions and then bend every effort to prove these assumptions by an investigation. Questions are developed to elicit replies which are favorable to preconceived theories. Investigations thus become trials with the committee in the role of the state prosecutor, and the procedure is simply a clever exhibition of nimble minds. War does not wait on these tactics and public patience is wearied by investigations for political advancement.

Brain Power Must Rule

REPETITIONS are being made in various quarters, some of them so illustrious as to attract thoughtful attention that the present war is freeing some social movements of extraordinary significance and character. The statement of Charles M. Schwab in a public address within the week that the day is dawning when the power of labor will be supreme in the world is a notable expression of this kind. A similar conviction is being voiced in various forms, some of which are quite radical, by others who are yielding to the impulse of prophecy and speculation as they observe the demoralization that now obtains in normal world conditions. Recent events in Russia, Great Britain and the Central powers are being pointed to as manifestation of the oncoming readjustment in the fundamental relations of society.

Mr. Schwab has something of a reputation as a prognosticator on the trend of industrial processes to his credit. Though he spoke of the coming power of the man who worked with his hands, he evidently did not intend to make his classification so restrictive. His subsequent remarks showed that what he had in mind was a sovereignty of achievement and not the exaltation of the man who works with his hands over the one who labors with his brain or contrarywise. Under such a ranking of deeds of mankind, Mr. Schwab himself would not be likely to suffer since he has a record of constructive accomplishment.

If this war has shown anything it has demonstrated that true national virility lies in the ability of a people to organize and to concentrate its resources. The very essence of successful organization lies in creative and masterful brain power. With it is linked indissolubly the wellbeing and prosperity of labor. For labor to dominate the world and stay in that position means that its creative abilities must be greatly extended and its responsibilities to society must be more freely assumed than is true at the present time. Much education of labor as a whole, and especially of its

leaders, is necessary before the utopian day when capital and labor may sit in equality at the same conference table and settle disputes on the basis of exact justice to all. The greatest trouble with labor always has been that it has not been willing to assume a share of the responsibility for the success of business enterprise which would entitle it to a proper voice with capital in the distribution of rewards, although it has insisted in a constantly growing fashion on dictating how the latter should be apportioned.

Exacting Care, a Shipping Necessity

SHIPPING today presents one of the most vital problems of industry. In fact it may be called properly *the* vital one. In order to escape the present difficulties many shippers have resorted to the express service. Before the heritage of abuse long directed against the railroad is willed the express companies, several factors should be considered. The labor supply has not paralleled the tidal wave of business which has swept over them and inefficient and inadequate help has filled the claim adjusters' files and the on-hand departments. To see that all possible aid and co-operation is extended these public carriers is the duty of shippers. This lies in the direction of proper packing, wrapping and marking and too much care cannot be taken.

It is true, however, in many cases no proper reason can be given by express companies for so-called "lost" shipments. A bundle of steel rods recently was taken from its burlap wrappings at an express office in Cleveland, the shipping tags removed and stuck under the wire holding the rods together. For some unknown reason it was not delivered and after weeks of delay was finally located in the on-hand department.

The war has brought many dislocations of business systems and methods. In no direction have these been more sweeping than in matters of transportation. That being so, ordinary standards of efficiency and of service are out of question and should not be expected. The shipper must take upon himself more than the usual prudence and responsibility in guarding against miscarriage in the delivery of his goods. The first duty of each shipper is to see that no act of inefficiency or omission within his own organization adds to the general confusion. There never was a time when more scrupulous attention should be paid to the manner in which shipments are made than under present conditions.

Checking Up the Ships

THE recently issued regulations showing the exhaustive tests to which an applicant will be subjected before he may secure a license for the necessary bunker fuel, port, sea and ship stores which will enable his vessel to clear port, reveal more clearly the intent of the war trade board to keep a close check on every ton of shipping in the service of Uncle Sam and his allies.

To secure a license a vessel owner must answer satisfactorily all the questions submitted in the regulations effective Feb. 1. Licenses will not be granted to sailing vessels wishing to enter the war zone; to any vessel which has previously disobeyed any order issued by the United States shipping board; to any vessel owner who refuses to deliver to the war trade board the names of all the vessels with their masters owned by himself; to any vessel which refuses to be bound by all of 19 individual regulations. These latter regulations cover principally the destination of the vessels and the nature of their cargoes. Of course, shipping touching parts of Germany, her possessions and allies are prohibited.

Vessel owners must sign affidavits that the return cargo of the vessel will be unloaded at a United States port; that there be no transfer of cargo, bunkers or stores while the vessel is en route to its destination or returning home. It is also specified that all neutral vessels and all American vessels not requisitioned by the United States shipping board shall first be approved by the chartering committee of the United States shipping board at New York. The committee will then hand down its decision to the war trade board.

The latest action of the war trade board will receive the hearty indorsement of the country. Tremendous responsibilities have resolved themselves upon that body to get the most out of available tonnage and to prevent any success or support to the enemy. That to enable this to be accomplished, drastic efforts of the severest character may be necessary, is reflected by the sweeping order of the fuel administrator which was aimed at insuring the ships a proper supply of bunker coal. By exercising a closer surveillance over outgoing vessels, the alleviation of the congestion on the Atlantic seaboard, owing to the improper distribution and the scarcity of fuel will be advanced. Furthermore, the guarantee which the regulations insure that the whole shipping world is exerting a unified and concentrated effort in the same direction will be of great importance.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE AND IRON ORE PRICES ON PAGE 348

PIG IRON

Bessemer, valley	$36.30
Bessemer, Pittsburgh	37.25
Basic, Pittsburgh	33.95
Basic, eastern Pa.	33.00
Basic, Buffalo	33.00
Malleable, Pittsburgh	34.45
Malleable, Chicago	33.50
Malleable, Philadelphia	34.00 to 37.50
Malleable, Buffalo	33.50

GOVERNMENT SCHEDULE

1.75 to 2.25 silicon (No. 2 foundry, No. 2 plain, and No. 3 southern)	$33 furnace base
2.25 to 2.75 silicon (No. 2X, No. 1 Northern foundry, and No. 2 southern)	base plus 50c
2.75 to 3.25 silicon (No. 1X No. 2 soft)	base plus $1.50
Over 3.25 silicon	$34.50, plus $1.00 for each ¼ per cent of silicon.
No. 1X, Phila.	35.25 to 35.50
No. 2 foundry, Pittsburgh	33.95
No. 2 foundry, Cleveland	33.95
No. 2 foundry, Ironton	33.00
No. 1 foundry, Chicago	33.50
No. 2 foundry, Chicago	33.00
No. 2X foundry, Phila.	34.25 to 34.50
No. 2X foundry N. J. tide.	34.25 to 34.50
No. 2X foundry, Buffalo	33.50
No. 2 plain, Philadelphia	33.75 to 34.00
No. 2 plain, N. J. tide	33.75 to 34.00
No. 2 southern Birmingham	33.00 to 33.50
No. 2 southern, Cincinnati	36.40
No. 2 southern, Chicago	37.50
No. 2 southern, Phila. del.	38.30 to 39.40
No. 2 southern, Cleveland	37.50
No. 2 southern, Boston	39.50
No. 2 southern, St. Louis	35.90
Virginia, No. 2X, furnace	33.50
Virginia, No. 2X, Phila.	36.77
Virginia, No. 2X, Jersey City	37.02
Virginia, No. 2X, Boston	37.27
Gray forge, Pittsburgh	32.95
Silveries, 8 per cent, furnace	46.00
Silveries, 8 per cent, Chicago	48.54
Low phos. standard, Phila.	55.00 to 56.00
Low phos., Lebanon furnace	50.00
Low Phos., Pittsburgh	53.00
Charcoal, Superior, Chicago	37.50
Charcoal, Superior, Buffalo	39.75
Charcoal, southern furnace	43.00

COKE

(At the ovens.)

Connellsville furnace	$6.00
Connellsville foundry	7.00
Wise county furnace	6.00
Pocahontas furnace	6.00
New River foundry	7.00
New River furnace	6.00
Wise county foundry	7.00

FERRO ALLOYS

Ferromanganese, delivered	$250.00 to 255.00
Spiegel, 20 per cent fur.	60.00
Spiegel, contracts, furnace	58.00
Ferrocarbon titanium, carloads, maker's plant	160.00
Ferrosilicon, 50 per cent, Pittsburgh	175.00 to 180.00
Ferrosilicon, 50 per cent, Pitts., 1st quarter	170.00 to 175.00
Bessemer ferrosilicon, 9 per cent.	$54.00
Bessemer, ferrosilicon, 10 per cent.	55.00
Bessemer ferrosilicon, 11 per cent.	58.30
Bessemer ferrosilicon, 12 per cent.	61.60

Ferrosilicon prices at Ashland, Ky., Jackson and New Straisville, O.

SEMIFINISHED MATERIAL

BILLETS

Open hearth, Pittsburgh	$47.50
Open hearth, Philadelphia	50.50
Open hearth, Youngstown	47.50
Bessemer, Pittsburgh	47.50
Bessemer, Youngstown	47.50
Forgin, Pittsburgh	60.00
Forging, Philadelphia	63.00

SHEET BARS

Open hearth, Pittsburgh	$51.00
Open hearth, Youngstown	51.00
Bessemer, Pittsburgh	51.00
Bessemer, Youngstown	51.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$57.00
Grooved skelp, Pitts.	2.90c
Sheared skelp, Pitts.	3.25c

SHAPES, PLATES AND BARS

(In cents per pound)

Structural shapes, Pitts	3.00c
Structural shapes, Phila.	3.185c
Structural shapes, N. Y.	3.195c
Structural shapes, Chicago	3.00c
Tank plates, Chicago	3.25c
Tank plates, Pittsburgh	3.25c
Tank plates, Philadelphia	3.435c
Tank plates, New York	3.445c
Bars, soft steel, Pittsburgh	2.90c
Bars, soft steel, Chicago	2.90c
Bars, soft steel, New York	3.095c
Bars, soft steel Phila.	3.085c
Bar iron, Chicago	3.50c
Bar iron, Phila.	3.50c to 3.685c
Bar iron, Cleveland	3.64c to 3.70c
Bar iron, New York	3.695c
Bar iron, Pittsburgh	3.50c
Hard steel bars, Chicago	3.00c
Cotton ties, Pitts., Jan.	$2.18

RAILS, TRACK MATERIAL

Angle bars, Pittsburgh base	3.25c
Angle bars, Chicago base	3.25c
Standard bessemer rails, mill	$55.00
Stand. open hearth rails, mill	57.00
Light rails, 25 to 45, mill	3.00c
Relaying rails, light, St. L.	75.00 to 80.00
Spikes, railroad, Pitts.	3.90c
Track bolts, Pittsburgh	4.90c
Track bolts, Chicago	4.90c
Tie Plates, Chicago	3.25c

WIRE PRODUCTS

(Per 100 lbs. to jobbers; retailers 5c more)

Wire nails, Pittsburgh	$3.50
Coated nails, Pittsburgh	3.45
Plain wire, Pittsburgh	3.25
Galvanized wire, Pittsburgh	3.95
Polished staples, Pittsburgh	3.65
Galvanized staples, Pittsburgh	4.35
Barb wire, painted, Pitts.	3.65
Barb wire, galvanized, Pitts.	4.35
Cut nails, Pittsburgh	4.00

CHAIN, PILING, STRIP STEEL

(In cents per pound)

Chain, ⅜ in proof coil, Pitts 8.00c
Sheet piling, base, Pitts. 4.00c to 5.00c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 6.50c.

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SHEETS

In cents per pound)

SHEET MILL BLACK

No. 28, open hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c
No. 28, open hearth, Chi.	5.215c

TIN MILL BLACK

No. 28, open hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c

GALVANIZED

No. 28, open hearth, Pitts.	6.25c
No. 28, bessemer, Pitts.	6.25c
No. 28, open hearth, Chi.	6.465c

BLUE ANNEALED

No. 10, open hearth, Pitts.	4.25c
No. 10, bessemer, Pitts.	4.25c
No. 10, open hearth, Chic.	5.715c to 6.215c
No. 10, open hearth, Phila	4.435c

TIN PLATE

(Per 100 lb. box)

Tin plate, coke base, Pitts. $7.75

IRON AND STEEL PIPE

Base Pittsburgh

Base Pittsburgh	Black Per cent off	Galv. Per cent off
⅛ to 3 in., butt, steel	51	37½
¼ to 3 in., butt, iron	33	17

BOILER TUBES

Steel, 3½ to 4½ inches, l. c. l. .30
Iron, 3½ to 4½ inches, c. l. .12½

CAST IRON WATER PIPE

(Class B Pipe.)

Four-inch, Chicago	57.30
Six-inch and over, Chicago	54.30
Four-inch, New York	58.35
Six-inch and over, N. Y.	55.35
Four-inch, Birmingham	52.00
Six-in. and over, Birmingham	49.00

HOOPS, BANDS, SHAFTING

Class A pipe is $1 higher than Class B.

Hoops, Pittsburgh	3.50c
Bands, Pittsburgh	2.90c
Shafting, Pitts., carloads	17 off to list

RIVETS

Structural rivets, Pittsburgh	4.65c
Boiler rivets, Pittsburgh	4.75c
Rivets ⅞ in. and smaller, Pitts.	45 and10 off

NUTS AND BOLTS

(Delivered within 20-cent freight radius)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	50–5 off
Cut thread	40–10–5 off
Larger and longer	40 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	50–10–5 off
Cut thread	50–5 off
Larger and longer	40–10 off
Cold pressed semi-finished hexagon nuts ⅝ in. and larger	60–10–10 off
Cold pressed semi-finished hexagon nuts ⅞ in. and smaller	70–5 off
Gimlet and cone point lag screws	50–10 off

NUTS

Hot pressed, square blank	2.50c off
Hot pressed, square tapped	2.30c off
Hot pressed, hexagon blank	2.30c off
Hot pressed, hexagon tapped	2.10c off
Cold pressed, square blank	2.25c off
Cold pressed, square tapped	2.00c off
Cold pressed, hexagon blank	2.25c off
Cold pressed, hexagon tapped	2.00c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago.)

Quotations on leading products January 30, average for December 1917, average for October 1917, and average for January, 1917. Prices are those ruling in the largest percentage of sales at the dates named

	Prices Jan. 30, 1918.	Average prices Dec., 1917.	Oct., 1917.	Jan., 1917.
Bessemer pig iron, Pittsburgh..	$37.25	$37.25	$37.25	$35.95
Basic pig iron, Pittsburgh....	33.95	33.95	33.95	30.95
*No. 2 Foundry pig iron, Pitts.	33.95	33.95	33.95	31.95
*No. 2. Foundry pig iron, Chi.	33.00	33.00	33.00	30.00
Lake Superior charcoal, Chicago	37.50	37.50	48.50	33.75
Malleable, Chicago	33.50	33.50	33.35	30.00
**Southern, No. 2, Birmingham.	33.50	33.50	33.00	23.00
*Southern Ohio No. 2, Ironton	33.00	33.00	33.00	30.00
Basic, eastern Pa.....	33.00	33.00	33.00	30.50
**No. 2X Virginia, furnace....	33.50	33.50	33.50	26.50
**No. 2X foundry, Philadelphia	34.25	34.00	34.00	30.50
Ferro mang., delivered.....	250.00	247.50	302.00	175.00
Bessemer billets, Pittsburgh....	47.50	47.50	58.75	60.00
Bessemer sheet bars, Pittsburgh	51.00	51.00	65.50	60.00
Open hearth sheet bars, Pitts..	51.00	51.00	65.50	60.00
Open hearth billets, Pitts.....	47.50	47.50	58.75	60.00
Steel bars, Pittsburgh.....	2.90	2.90	2.90	2.975
Steel bars, Chicago.....	2.90	2.90	2.90	3.19
Iron bars, Philadelphia.....	3.50	3.685	4.935	3.159
Iron bars, Cleveland.....	3.64	3.64	4.50	3.00

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

	Prices Jan. 30, 1918.	Average prices Dec., 1917.	Oct., 1917.	Jan., 1917.
Iron bars, Chicago mill.....	3.50	4.50	4.50	2.85
Beams, Chicago.....	3.00	3.00	3.00	3.19
Beams, Pittsburgh	3.00	3.00	3.00	3.075
Beams, Philadelphia	3.185	3.185	3.185	3.509
Tank plates, Pittsburgh	3.25	3.25	3.25	3.575
Tank plates, Chicago	3.25	3.25	3.25	3.89
Tank plates, Philadelphia ...	3.435	3.435	3.435	4.909
Sheets, blk., No. 28, Pitts....	5.00	5.00	7.75	4.56
Sheets, blue anld., No. 10, Pitts	4.25	4.25	7.875	4.125
Sheets, gal., No. 28, Pitts... ..	6.25	6.25	8.8125	6.56
Wire nails, Pittsburgh.....	3.50	3.50	3.875	3.00
Connellsville fur. coke.....	6.00	6.00	6.00	7.25
Connellsville fdy. coke.....	7.00	7.00	7.00	6.375
Heavy melting steel, Pitts.....	30.00	30.00	31.50	23.25
Heavy melting steel, eastern Pa.	30.00	28.75	26.10	21.50
Heavy melting steel, Chicago.	30.00	28.50	27.00	20.25
No. 1 wrought, eastern Pa....	35.00	35.00	40.80	26.50
No. 1 wrought, Chicago.....	35.00	31.50	36.25	25.35
Rerolling rails, Chicago.....	35.00	35.75	36.00	27.25
Car wheels, Chicago.....	30.00	29.50	31.00	21.85

(For Additional Prices See Page 348)

Basic Supply Problem of Consumers

Thousands of Tons of Steelmaking Metal for Delivery by Midyear Are Unobtainable —Last Half Selling of All Grades More General and Heavy Tonnage Booked—Furnaces Forced to Pile Iron

Cleveland, Jan. 29.—A tremendous shortage of basic iron for delivery by July 1 continues to be marked by the energetic but futile efforts of consumers in this and surrounding territory to fill their needs. It is estimated that 200,000 tons of unfilled demand by midyear are in sight. A Pittsburgh district consumer wants 30,000 tons; a northern Ohio plant which has been buying freely 20,000 tons additional for second quarter and 25,000 tons for last half; a Massillon, O., buyer, 15,000 tons; a Lorain, O., works, 5000 to 10,000 tons; an Ohio river consumer, an indefinite tonnage, and there are various other lots in sight. The difficulties of obtaining first half metal have intensified the desire of steelmakers to buy basic for the last half and some further large sales have been made. A northern Ohio interest added 15,000 to 20,000 tons to its recent last half purchases during the week. A Lorain, O., plant bought its last half requirements, representing 20,000 to 25,000 tons and was obliged to go to the Chicago district to fill this order. Selling of foundry, malleable and other grades for last half by certain producers along the lakes and in the valleys still is going forward. One maker's sales of the week reached 30,000 to 40,000 tons; another has disposed of only slightly less than 100,000 tons this month. A Buffalo interest which has been booking freely and has collected a large aggregate of orders, including about 5000 tons in this territory, has withdrawn. The General Electric Co. wants 2000 tons of malleable and 200 tons of high silicon bessemer. New government inquiries are numerous, including 800 tons of foundry for Chicago delivery, 800 tons of malleable for Beloit, Wis., and 900 tons of foundry, including a small amount of charcoal for the Brooklyn navy yard. All but 1000 to 1500 tons of charcoal remain to be placed of the recent 8000 tons inquiry for the navy. The 1000 tons of foundry for Italy probably will go to Alabama makers. Little improvement in traffic conditions among the furnaces is noted because of embargoes though production is a little better. Makers have been obliged to pile iron or keep it in cars because it could not be hauled away at once.

A tendency is manifest on the part of some producers to sell to Canadian customers on practically a cash basis. The reasons given for this are that the financial status of Canadian foundries is not so good and that taxes are stifling many of the industries. Implement makers in Canada are buying limited tonnages of foundry.

Business at Low Ebb

Boston, Jan. 28.—Current business in pig iron is at a very low ebb, for there is so little spot or prompt stock available and what is offered is mostly offgrade that will hardly fit into the needs of those who have not obtained what they contracted for and badly need supplies to tide them over. Shipments of iron billed to government plants or government inspectors from the northern regions are coming along in fairly satisfactory fashion but deliveries from Virginia and Alabama are very slow and unsatisfactory. There are plenty of inquiries in the market, but the great trouble is in placing them. Embargoes still play havoc with companies work-

ing on nonessentials which have iron on the way and the coal shortage is still a long way from being relieved. Indeed, the belief gains ground that the coal shortage is not going to be relieved by the efforts that are now being put forth, but will come only with warm weather. There is more or less inquiry for last half iron with a fair amount of business being booked subject to government revision of prices March 31. Some New York state makers have closed considerable tonnage in New England territory for last half shipment.

Furnace Prostration Threatened

New York, Jan. 26.—Estimates are heard that sales of second half foundry iron in the metropolitan district during the past 10 days or two weeks have aggregated 40,000 to 50,000 tons. This iron, all of which is to be billed at the government price prevailing at the time shipment is made, was sold by only a few furnaces, none of which are in the immediate eastern district. So far, the selling of second half iron subject to price revision has not become popular in the east. As far as known, the iron sold of late for second half shipment is going entirely to consumers who are engaged on war requirements. Scarcity of coke at eastern furnaces is reaching a most acute stage. Stacks on all sides are being forced to bank and a great many which still are in operation report they have only sufficient coke on hand to keep them going for another day or two. Unless deliveries of coke show a material improvement without delay, by far the greater portion of the eastern production threatens to be prostrated. Inquiries continue to come out for pig iron for all positions. A great deal of it involves first quarter or first half shipment. Anything short of July 1, however, is almost impossible to obtain, with the exception of odd lots of off-iron which occasionally can be had. The Worthington Pump & Machinery Corp., which early this week put out an inquiry for some 7500 tons of foundry, charcoal and silvery iron for second half delivery to its various plants, has not closed. An inquiry for basic iron, which a New York state melter recently put out, is understood to be unclosed.

Weather Retards Relief

Buffalo, Jan. 29.—Blast furnaces in this district still are working under serious handicaps through lack of coke due to only partial railroad service, and on account of the continued cold which has done much to counteract the relief which would have resulted from the five-day suspension order. Producers find some hope in the fact that the arrival of better weather should allow some of the good effects of the order to make themselves evident. Quite a little last half business was taken on by one furnace, practically the only one in a position to contract. Due note has been taken of the possibility of the government making some sort of a revision on pig iron prices on March 31 and this has resulted in the following arrangement: All iron sold now for last half delivery will be sold with the proviso that what iron has been shipped at the time of revision will not be subject to the revised prices. All iron, however, which is part of a contract made now, and which remains unshipped at the time of revision will be subject to new prices. In the aggregate very little tonnage was disposed of throughout the district and not much gain was made in catching up on behind-hand shipments. Foundries and other plants not working on war orders find themselves unsupplied. The situation is tight as to obtaining iron for the first half now and what small lots have been offered have been eagerly bought.

Freight Situation Unchanged

Cincinnati, Jan. 28. — Moderate weather the latter part of last week gave some encouragement to pig iron producers and consumers, but this optimistic feeling was short-lived. Today the transportation situation is in almost as bad shape as it was during the first week in January. There does not seem to be any likelihood of the different freight embargoes being lifted at any early date. This will mean that southern iron cannot enter this market, and should the foundries run out of iron entirely they will have to depend on northern producers to supply their needs. Due to the very serious coke shortage production in all districts, especially in Ironton and vicinity, is very materially cut down. Inquiries for last half foundry iron still are coming in, although southern furnaces appear to be the only ones that will take on business for that delivery.

Embargoes Hit Business

St. Louis, Jan. 26.—Embargoes, blizzards, shutdown orders and other unusual disabilities have worked havoc with the pig iron industry in this district. Dealers are at sea. There is little likelihood of a return to even an approximation of normal for days to come. Business for prompt delivery or to April 1 reported this week was confined to a few stray carlots, and not of volume sufficient to gage the market. Inquiries have fallen off radically, for the chief reason that consumers know there is nothing to be had and are saving themselves labor and postage. St. Louis is hemmed in at the moment by embargoes.

Many Inquiries Being Received

Birmingham, Ala., Jan. 22.—Southern furnaces are receiving many inquiries for iron and are selling in some cases, though not in great quantity. Some of the producers announce they are out of the market for delivery before July 1 except on a few grades. Reiteration is made that all contracts made for iron for delivery after April 1 are subject to government revision, but this has lost effectiveness and consumers are willing to buy where they can get their business accepted. Production and delivery are both slow in the southern territory. Improvement has been expected in both directions, but obstacles come up almost weekly. The railroad situation shows no improvement and attention is called to the nine cars of iron bound for Pennsylvania consumers that still are standing on side tracks in this district because embargoes are in effect toward the east.

Study Form of Contracts

Pittsburgh, Jan. 29.—Producers of pig iron are interested chiefly these days in the form contracts for last half shipment shall take. There are three distinct periods, the present, with prices fixed by the government, March 31, after which prices are subject to revision and the end of the war when the tendency of the market is an unknown quantity. The proposed contract that appears to meet with most favor provides that in the event there is no government price—or when peace is restored—the levels to prevail shall be those in effect at the time the contract was made. This, it is pointed out, has merit in that it guarantees consumers their supplies of iron and furnishes a basis upon which their estimators can work, and therefore be in a position to quote definitely on their semifinished or finished products, and also protects the seller. Another proposal makes the prices subject to revision on April 1, with the maximum government level in effect at the time shipment is made. Still another suggestion calls for the application of trade journal or open market quotations at the time deliveries are made, a condition that would, of course, prevail after the war and when government regulation ceases. A number of producers are selling

iron for last half delivery and the aggregate mounts up to a fair-sized total. Foundry and basic iron are the chief grades involved in these sales. Makers are as a general thing selling only to their regular customers and are not actively soliciting business for last half, inquiries for which are increasing. There is practically no inquiry for first half makers being either entirely committed for that period or unwilling to sell except on a spot basis. Free tonnages are extremely small. A steelmaker east of Pittsburgh wants 30,000 tons of basic before July 1. Blast furnace operations in this district continue to be made on a sharply restricted basis due to a shortage of coke. The Carnegie Steel Co. is operating only 30 out of its 59 furnaces and the Jones & Laughlin only four out of its 11.

Can't Get Basic in East

Philadelphia, Jan. 29.—Pig iron sales in this district the past week totaled from 20,000 to 25,000 tons, including 10,000 to 12,000 tons of second half foundry, and some 6000 second and third quarter basic. The remainder was made up mostly of nearby foundry and off iron. The second half foundry was sold principally by furnaces not in this immediate district and on price revision basis. This maker now has withdrawn from the market, having booked a heavy tonnage for last half in all districts. Eastern furnaces continue to decline business on this basis.

Buying Freely at Chicago

Chicago, Jan. 29.—With the form of contract decided on to cover pig iron sales for last half, the Chicago market has opened up with much activity and a real buying movement is on. Contracts accepted tentatively, subject to the new revision clause, have been executed and are satisfactory to consumers. These are believed to cover practically one-third of last half production in the Chicago district, and with buyers anxious to cover their requirements for the remainder of the year the entire available tonnage to Jan. 1, 1919, is expected to be under contract within a short time. The new clause incorporated in current contracts by Pickands, Brown & Co., is as follows: "The prices to be paid by the purchaser for any of the materials named herein, which are shipped under this contract after March 31, 1918, shall be the price fixed for that time by proper U. S. government agency by agreement or otherwise, as the public or market price for such material, instead of the price herein named."

Snow Upsets Coke Traffic

Drifts in the Mountains Shut Off Connellsville Regions from Many Furnaces—Modified Weather Revives Hope of Betterment

Pittsburgh, Jan. 29.—The extreme storms and heavy snow drifts have demoralized traffic conditions in the Connellsville coke region. Telegraph wires were torn down and interrupted the movement of trains and shut off direct communication of blast furnace interests with coke operators and the railroads in the region. In consequence the movement which was already unusually slow has been delayed further and made the shortage of fuel at furnaces more acute. Later reports indicate that the lines of the Pittsburgh & Lake Erie railroad and the Monongahela railroad are being cleared up and wires are being restored. The principal difficulty was in the mountains beyond Connellsville and this side of Rockwood and between Johnstown and Altoona, Pa., where drifts of snow 12 feet deep at some points stalled trains, some of them carrying shipments of coke. Trains were also snowbound on the Pennsylvania railroad east of Greensburg. This also delayed the movement of coal and coke which are so urgently needed at blast furnaces and steel works. Provided the weather continues to moderate as it has been doing during the past two days, marked improvement is expected to be shown in the movement of fuel. At the same time there is some apprehension that the extremely heavy blanket of snow lying in the mountains and the valleys together with the ice in the rivers would cause a tremendous flood and do vast injury in this district if an abrupt thaw took place. The fuel administration is making efforts to concentrate on the shipments of coke and coal, the movement of the latter to be expedited through the creation of zones. Fuel was exempted in the embargo order recently issued by Director General McAdoo, with a view to making shipments of coal and coke as freely as possible. It has had the effect, however, of further congesting traffic conditions in the yards of iron and steel plants and caused an additional check in operations. Production for the week ending Jan. 19 was 238,425 tons as compared with 237,707 tons for the preceding week, according to *The Connellsville Courier*.

Closing Yearly Contracts

New York, Jan. 26.—Numerous yearly contracts, both for foundry and furnace coke, have been closed in eastern territory during the past couple of weeks, involving many thousand tons per month. A large part of the contracts call for delivery over the year. Other contracts call for shipment over the remainder of 1918. All of this business was closed at government prices and went to Connellsville and other Pennsylvania producers. The New England by-product coke producer continues out of the market, because of heavy bookings and also to fears over the maintenance of coal supply.

Situation Grows Worse

Cincinnati, Jan. 28.—A prominent seller says: "The coke situation is the same as it has been for the past four weeks—except that it is worse." Labor appears to be giving a great deal of trouble in all districts. The ovens are short of help and the last cold spell has made this situation a more serious one. In some fields it is stated that practically no 48-hour coke has been made lately, as labor is too scarce to draw charges on time.

Expected Relief Denied

St. Louis, Jan. 26.—Surpassing difficulty is experienced by consumers in this district to secure metallurgical coke. For the first time since the advent of the acute shortage, several plants have been obliged to shut down entirely or abandon part of their activities. The breathing space afforded by the Garfield 5-day order has failed to help things out here in the matter of coke, though more coal is crossing the river than at any time since the recent severe weather set in.

Demands are Extraordinary

Birmingham, Ala., Jan. 26.—Both coal and coke production in Alabama are being maintained on a high keel, but the shortage remains acute. The action of the government in dividing the coal production and distribution into zones and appointing an agent for each zone, may bring about some satisfactory results. The new administrator will not interfere with the state and local administrators. The coke plants have been fairly well cared for but at most the output is none too great for the demand. The production of coal is being maintained as well as could be expected. The prospects now are that in the next few days many differences between operators and union miners will cease.

Embargoes Stifling Scrap

Demoralized Traffic Conditions Make Consequential Business Impossible—More Inquiry at Pittsburgh—General Scarcity Acute

FOR COMPLETE SCRAP PRICES SEE PAGE 348

Pittsburgh, Jan. 29.—No. 1 heavy melting steel, low phosphorus scrap, cast borings and machine shop turnings are in active demand. One large consumer is in the market for a good sized tonnage of heavy melting steel. Supplies are inadequate to meet the demand. Dealers report their stocks either are entirely exhausted or extremely low and that much difficulty is being experienced in obtaining material. Shipments are also hindered greatly because of embargoes. The American Bureau of Scrap Iron Dealers, with headquarters in Philadelphia, is aiding in facilitating the business of dealers in the way of obtaining permits for them to make shipments. This is being done frequently where cars have been rejected and reconsigned to other consumers. Reports are in circulation that some dealers have been compelled to pay prices in excess of those established by the government in order to obtain tonnages, but there is no known instance where consumers have paid more than the government prices plus the permissible commission of 3½ per cent. The price of $35 fixed for No. 1 busheling scrap is taken by the trade to be entirely out of line with the price of heavy melting steel.

Buying at Standstill

Boston, Jan. 28.—Business in old iron and steel has come pretty much to a standstill in this territory as a result of the railroad situation. Embargoes are in force and these make impossible shipments, although much stock is wanted and would be moving if the transportation facilities were available. Prices are firm and inclined higher, for the railroad situation is operating against collections and supplies also are restricted by the fact that mills cannot get new machinery to scrap old and much worn equipment. Once the rails get cleared, it is believed a big business in scrap is going to be done. Wholesale dealers' paying prices per gross ton f.o.b. shipping points follow: Wrought No. 1, yard long, $30 to $31; horseshoes, $30 to $31; cotton ties, $21 to $22; stove plate, $20 to $20.50; No. 1 machinery, $33.50 to $34.50; No. 2 machinery, $28 to $29; car axles, iron, $43 to $44; steel, $43 to $44; rerolling rails, $30.50 to $31; iron boiler plate, $34 to $35; bundled barrel hoops, $17.50 to $18; wrought iron pipe, new specifications, $27 to $28; steel rails, $27 to $28; No. 1 railroad steel, $26 to $26.50; heavy melting steel, $25.50 to $26.50; axle turnings, $21 to $22; machine shop turnings, $13 to $16; cast borings, $16 to $17; drop forge trimmings, $21 to $22; cast iron car wheels, mill price, $35 to $37.

Scarcity More Marked

New York, Jan. 29.—Although scarcity of iron and steel scrap has become more marked during the past few days, prices generally have undergone but little change. What is regarded by many in the trade as a steadying factor is the possibility of a downward revision of prices on several grades as a result of recommendations made to the Iron and Steel institute last week. These recommendations followed the meeting in this city of scrap iron dealers and consumers representing iron mills, gray iron steel and malleable foundries throughout the country. The appointment of a new subcommittee on scrap to consider a readjustment of prices which was recommended, has brought no announcement as yet. Demand continues plentiful, but owing to difficulties in making shipments much of this business falls short of consummation.

Stagnant Condition Continues

Buffalo, Jan. 29.—The scrap situation in the Buffalo district presents little change from its stagnant condition of last week brought about by the confusion of general business due to the fuel and traffic situations. Severe weather has multiplied the difficulties of the scrap dealers. Shipping is virtually impossible not only because of the lack of labor, but because of the multiplicity of embargoes. Three put into force last week on eastern railroads still are in force and these have further knotted a complicated condition. Scrap is growing scarcer in most consumers' yards, though some are said to have been farsighted enough to anticipate the present traffic situation and make the best of the privilege they had of buying scrap last year. The demand would be good if there was any way of shipping. Dealers are inclined to believe there may be a modification of all grades of scrap coming under the heading of No. 1 wrought, due to the action of the American Iron & Steel institute in recommending the appointment of a new committee on scrap. There has been no further change in prices.

Chicago Market Dull

Chicago, Jan. 29.—Owing to reduced operation on the part of most scrap consumers and slow transportation conditions, the Chicago scrap market is simply marking time. With railroads engaged practically in moving coal and food, scrap is difficult to deliver and dealers find that the conditions which limit its delivery likewise cut down offerings and both sides of the market thus are reduced to a minimum. Most consumers find it possible to continue their limited operation on reserves already in hand and cars now in transit are being delivered slowly to add to their supply. Following the enforced idleness of most manufacturing concerns a week ago, production of industrial scrap has been reduced and railroads are offering comparatively little. The Chicago, Milwaukee & St. Paul has issued a list embracing 450 tons and the Michigan Central has asked figures on an open list, in which tonnages are not given.

Fixed Prices Not Established

Cincinati, Jan. 28.—Very little scrap is being received from the outside, but labor is so scarce during the present cold weather the dealers rather welcome this condition. Scrap sorters in zero weather are hard to get. Some confusion exists as to prices on cast scrap. No sales of consequence have been made since the government's schedule was issued and many dealers say these new quotations have not been established in this market. No shipments can be made to the large consuming districts and not much scrap is wanted locally.

Market Without Life

St. Louis, Jan. 26.—The market for iron and steel scrap locally has degenerated into a state of almost total paralysis. Sales during the week were astoundingly light for a market of this magnitude. Prices have been shaded a bit on certain grades but the changes are based more on sentiment than actual transactions. The shutdowns had relatively little effect on this market, as none of the plants on the west side of the Mississippi river were affected. Dealers' stocks in yards and in transit are fairly liberal, but to offset this fact, consumers' reserves have been cut heavily

and certain of the more important melters must soon replenish, especially if their contract material does not arrive more promptly. Consumption, despite the various unfavorable factors, continues near the recent maximum.

Scrap Uncertainty Continues

Birmingham, Ala., Jan. 26.—Stocks of iron and steel scrap on yards of dealers here are beginning to diminish by reason of no receipts. Quotations are given as last week, but it is openly stated that these prices are about $1 per ton higher than those that probably would command material. Embargoes on railroads in several directions are having the effect of making outside business impossible. It is even difficult now to get cars with which to handle scrap in southern territory. While cast iron pipe plants have resumed operation again there has not been acceptance as yet on much scrap. Some little deflection in the production of steel has also been felt by scrap iron and steel dealers.

Dealers More Hopeful

Cleveland, Jan. 29.—Iron and steel scrap dealers in this district seem more optimistic than at any time since railroad congestion, coal shortage, government price fixing and unseasonable weather began to dominate the market. Permits for shipments have come much more easily the past week, and though no large movement took place, a noticeable picking up in every branch of the trade is expected. Dealers generally are confident that milder weather and the new zone system of distributing coal, together with a general easing up of the railroad situation, will mean increased business all around. One melter in northern Ohio whose great need is for low phosphorus from a Cleveland steel plant was forced to suspend entirely last week because the latter was down from lack of coal. Few inquiries are reported and no sales worth recording have been made. Melters' stocks are fair, although some have been badly reduced and soon will be in need of replenishment. In the past week stove plate has been marked up $2 a ton; grate bars, $1.50; small forge flashings, 50 cents, and hydraulic pressed sheets, $1. Considerable uncertainty still exists in the minds of some Ohio dealers as to the definition of cast scrap.

The General Electric Co., Schenectady, N. Y., has completed a 56 x 809-foot addition, which will be used exclusively for the manufacture of motors.

Revive Shell Controversy

Decide on New Specifications But These Held Up—Contracts Transferred—Steel Shortage Becomes More Pronounced

New York, Jan. 29.—Important changes in shell steel specifications have been arranged for as the result of meetings the past week between representatives of the government and of the producers. The new specifications have been decided upon, but they have been held up due to the complaints from some of the various plants interested. In the meantime a number of the mills are held up in the operations awaiting the final adoption of the specifications. As a measure to help untie the rail tangle by reducing the length of the haul, the government has withdrawn a number of shell steel contracts which it had placed during the past couple of months. These have been transferred to other mills which are nearer to the plants at which the steel is to be converted into shells. Transfers of contracts in this manner, it is understood, are to be carried out as extensively as possible. As far as known, such switches as have been made up to this time, involve only shell steel.

Small Strip Sales Made

Pittsburgh, Jan. 29.—Small tonnages of cold-rolled strip steel are being taken by domestic consumers. Automobile manufacturers have not become an active factor in the market and it is apparent that buying is being restrained because prices are subject to revision on April 1. The government continues to take good-sized tonnages for airplanes, grenades, trench mortars, etc. Producers are operating at about 50 per cent of capacity and are having extreme difficulty in making shipments. They appear to be well supplied with steel, however, and operations have not been affected by a lack of rolling material.

Inquiries are Limited

Pittsburgh, Jan. 29.—Realizing the impossibility of covering their requirements, many consumers have withdrawn from the market for billets and sheet bars. Sellers report that they have no available tonnages for additional needs. Railroad embargoes are also holding up shipments. Sheet bars are being furnished as much as possible to tin plate mills which are rolling tonnages required in connection with the food conservation program. Sheet mills have been compelled to curtail operations because of a lack of steel and traffic congestion and some of them are producing at the rate of less than 40 per cent of capacity. The output of sheet bars and billets was further curtailed by the five-day shutdown order as well as by the one in effect yesterday. This reduction in steel output is not causing any serious concern except for the resulting restriction of the production of sheets and tin plate inasmuch as the steelmaking and rolling capacity exceeds the pig iron supply. The production of bessemer steel has been at a negligible point during the shutdown as none of this kind of steel is represented in war requirements.

Can't Get Material

Cleveland, Jan. 29.—Slabs and sheet bars continue exceedingly difficult to obtain by the consumer without a government contract. Companies in this class which recently put out inquiries have found the mills blocked with war business and are asking for material less vigorously, appreciating the difficulty. The best these buyers can do apparently is to pick up odd lots of misfit heats. Producers of semifinished steel in this district continue to receive various orders for billets, slabs and sheet bars to go into government business, and practically 100 per cent of their output is being distributed in this way. An inquiry for 400 tons of forging billets for Denver ordnance manufacture has been current.

British Want Shell Steel

Youngstown, O., Jan. 30.—Large tonnages of shell steel continue to lay in the mill yards pending the nullification of embargoes. However, Erie railroad officials announced if the cold spell the latter part of last week had not occurred, they would have lifted their embargoes. The Baltimore & Ohio has agreed to distribute 100 cars daily among the large steel companies in this city for the movement of government material west. Of this number one steel company is receiving 22 cars daily and is loading them with shell steel from a 2500-ton stock pile which had accumulated over the past three weeks. Great Britain is about to place a 50,000-ton order for 4.5 millimeter stock. Mills here have been asking whether they will accept a part of this tonnage. In view of the tremendous government bookings in shell steel, it is possible valley mills will be compelled to pass this business.

Insist on Bar Reduction

Nut, Bolt and Rivet Makers Declare They Must Have 2.90c Figure Written Into All Contracts—Fleet Needs Tonnage

Philadelphia, Jan. 30.—Further repudiation of steel bar contracts with independent producers with eastern plants have been made mainly by the nut, bolt and rivet manufacturers. The latter declare that it has been the general custom of producers in their line throughout the country to waive the high prices on old bar contracts and to substitute therefor the government price of 2.90c, Pittsburgh. These particular interests state they are being forced to follow suit. What course of action the mills intend to pursue has not been indicated. Much interest is being manifested in the trade as to the outcome of this situation owing to its bearing on other products.

Production at Low Point

Pittsburgh, Jan. 29.—Production of steel bars by mills in this district is at a low point, some of them operating at not more than 50 per cent of their capacity and others being down altogether on account of shortage of steel and the transportation situation. Demand is fairly heavy and most producers are well booked for the first half. The Emergency Fleet corporation is expected to come into the market soon and place contracts for approximately 30,000 tons of steel bars. Makers of iron bar report that demand is heavy and that they are well committed for the first half. The government is taking fair sized tonnages of iron bars and is also placing orders for steel rounds.

Mills Willing to Sell

Cleveland, Jan. 30.—Several makers continue to be receptive sellers of bars to the general trade, but outside of the implement manufacturers no extensive buying is being done. Production has been greatly reduced during the past week by the continued unfavorable weather and traffic conditions. A jobber has been inquiring for 2000 tons. Various miscellaneous war requirements are in the market and these include a new lot of 600 tons of 2-1/16-inch rounds for a Canton consumer. There is an active call for large rounds which the mills have difficulty in filling.

Government Buys Shafting

Pittsburgh, Jan. 29.—While commercial buying of cold-rolled shafting is extremely limited, fair-sized tonnages are being taken by the government. The automobile trade has not come into the market. These prospective buyers evidently are withholding purchases partly because they have not yet consumed all the stock they have on hand and also on account of the fact that prices are subject to revision on April 1. Lack of fuel and the congested condition of transportation greatly have restricted operations.

Western Market Quiet

Chicago, Jan. 29.—Selling of soft steel bars is limited, although the leading interest continues to book contracts for small tonnages to be delivered at convenience. The leading independent is unwilling to book further business for second quarter and has as much as it can handle for first quarter delivery, especially in view of reduced production following untoward weather conditions. Makers of bar iron are selling practically only on a spot basis and contracts for this product are not being made. Demand is light and small tonnages are being taken for nearby delivery. Production is considerably reduced by the closing order of the fuel administration.

Hard steel bars are inactive and mills are running only part time with demand light and comparatively little new business offering.

Navy Wants Rivets

Pittsburgh, Jan. 29.—Active demand is being made for nuts, bolts and rivets, either directly or indirectly for the government. The navy department has put out an inquiry for 3000 tons of rivets and the business is expected to be closed within the next 10 days. Heavy requirements for nuts and bolts are also being placed, much of this business coming from the Emergency Fleet corporation and the war department. While some makers have sufficient supplies of fuel to operate, they will be compelled to close down within the next day or so, unless relief comes from the congested condition of traffic in their yards.

Big Bolt Order Closed

Youngstown, O., Jan. 30.—Considerable tonnage for nuts, bolts and rivets has been placed lately with valley mills by the Emergency Fleet corporation. While government requirements comprise a large per cent of the output of the mills, domestic and foreign buyers are being served. The production of steel bars has been at a low ebb for some time due to coal and shipping conditions. In spite of this setback, one maker closed an order recently for 12,000,000 carriage bolts for export. The order will aggregate close onto 9000 tons, since about 65 per cent of it calls for 6 and 8-inch bolts. It is understood the material will be used in constructing transportation wagons, gun carriages, and other miscellaneous purposes. Rumors are current that a manufacturer in a nearby district is offering bars to July 1. However, makers in this territory are adhering to the government request and are confining their sales to April 1.

Hoops in Active Demand

Pittsburgh, Jan. 29.—Active demand is coming from domestic consumers representing miscellaneous lines for hoop steel, tonnages of which are being sold at 3.50c, Pittsburgh. There is also inquiry for foreign shipment. The government has taken 300 tons for shipment to France. The market for bands is dull.

Cities Delay

Purchases of Cast Iron Pipe—Jobbers Want Mill Goods

Chicago, Jan. 29.—Cast iron pipe sellers find little tonnage pending, although indications are that some municipal inquiries will come out within the next few weeks when annual appropriations have been completed. It appears likely that buying for city extensions will be light this year, in view of difficulty encountered in marketing improvement bonds. The market for this class of securities is said to be backward. Bids will be opened Jan. 31 at Akron, O., on 900 tons. Pipe shops are not rushed with orders and one large producer is able to keep up activity because of a heavy order for pipe to be sent to Japan.

Inquiries Are Held Up

New York, Jan. 29.—Despite the season and difficulties attending shipments, a good demand continues to come out in the east for cast iron pipe. Public work is scarce, but manufacturers report a good volume of inquiry from private sources, and within the past few — several sizable tonnages have been placed. Nevertheless, business is moving under a heavy handicap as a result of insufficient transportation facilities. Consumers in many instances are withdrawing their inquiries. This is par-

ticularly true in the case of exporters. Italy, it is believed, would place a large tonnage if it were not for the uncertainty over shipments. Considerable business in the Far East also is being held in abeyance until more adequate transportation facilities are afforded, and such is the case with two or three good-sized inquiries from South America. Perhaps the latest inquiry to come before the trade from a foreign country is one from the Philippines. Among difficulties confronting manufacturers at this time is the scarcity of pig iron.

Jobbers Increase Demands

Pittsburgh, Jan. 29.—Jobbers are making more active demand for iron and steel pipe, having shown greater interest in the market as the result of the Garfield shutdown order, and are covering requirements in anticipation of a curtailment of production. Mills making oil country and railroad goods are exempted under the order, which permits some to operate fully, among them being those of the A. M. Byers Co. The buying movement also follows the recent seasonal dullness during which inventories were taken. Lap weld grades chiefly are being sought. The market for butt-weld tonnages does not show marked improvement, due to the small amount of building operations over the country.

Still Waiting for Improvement

Birmingham, Ala., Jan. 22.—Cast iron pipe plants again are melting iron though not as voluminous as before the recent shutdowns. Hope is expressed that as the severe weather of the winter soon will be on the wane and spring will set in that considerable work will be given consideration, for which cast iron pipe will be needed in quantity. Foundries and machine shops throughout the Birmingham district are working practically on full time.

Nail Demand

Better than for Wire—Outputs Brought Down Sharply.

Pittsburgh, Jan. 29.—Domestic demand for wire is only moderately active, while it is somewhat better for nails. The government continues to place requirements for nails. Wire mills have lost large tonnages on account of lack of steel and fuel and because of railroad embargoes. Some have been entirely down several weeks, while others are operating only a small portion of their capacity. Both buying and selling are restricted by reason of the fact that prices are subject to revision on April 1.

Huge Plate Orders Near

Fleet Corporation to Close 400,000 to 500,000 Tons—Eastern Mills Allotted Further Tonnages by Government

Pittsburgh, Jan. 29.—Reports coming from reliable sources indicate that the Emergency Fleet corporation is about to place contracts for between 600,000 and 700,000 tons of steel. Of this about 70 per cent or 420,000 to 500,000 tons will be for plates, about 25 per cent or 150,000 to 175,000 tons will be shapes, and approximately 5 per cent or 30,000 to 35,000 tons will be steel bars. It is understood that these tonnages will be distributed among a number of makers and that mills will be in a position to produce it, and make satisfactory deliveries provided there are no interruptions to operations in the way of shortage of steel or traffic conditions. There is also an increasing belief that the government is about to place orders for cars, although the report so far is of a more or less nebulous character. No car orders have been placed during the past week. Builders report that they have sufficient supplies of plates on hand and have no difficulty in obtaining requirements when they are needed. The Pressed Steel Car Co. has been granted full exemption under the Garfield order and was operated as usual yesterday.

More Ship Steel Needed

Cleveland, Jan. 29.—About 10,000 tons of steel will be required for eight ocean-going steamships of 3550 deadweight capacity which have been ordered by the Emergency Fleet corporation from the Toledo Shipbuilding Co. Two of the vessels are for delivery this fall and the remaining six for 1919. The steel requirements of this order have not reached the mills. Modifications of high-priced plate tonnage continue to be made by some of the mills. In some cases this is taking the form of enlarging the tonnage called for so that the net loss on the original contract under the government price shall be spread over a greater quanitty.

Mill Production Slow

Chicago, Jan. 29.—Although steel plants producing plates for government use have been exempted from the fuel administration's closing order, other conditions have prevented anything like full operation and production is greatly curtailed. Both the leading interest and the leading independent have made every effort during the past week to turn out material needed for ships and other government purposes, but nothing like 50 per cent production has been possible. The former producer is handicapped by lack of fuel and the latter by inability of railroads to furnish cars to handle the finished material as fast as it can be turned out. Blizzard weather at the end of last week opposed a further obstacle to railroad operation, both in transportation of fuel and finished material. This puts further into the future the time when mills can do still more effective work.

Fleet Tonnage Allotted

Philadelphia, Jan. 30.—The Midvale Steel & Ordnance Co. has been allotted 20,000 tons additional consisting mostly of plates for the Emergency Fleet corporation. Other eastern mills received smaller tonnages. Production among eastern plate makers generally is being restrained to 50 or 75 per cent owing to the coal shortage. The mills have been forced to be dependent upon day to day receipts of fuel. Apart from government requirements, plate demand in the east is diminishing.

Stored Tonnage

Of Tin Plate to be Moved Swiftly to Avoid Damage

Pittsburgh, Jan. 29.—Efforts are being made to have priority given to shipments of tin plate in order to move in greater volume tonnages which have been stored on account of a lack of cars. Apprehension prevails that unless tonnages which are stored along the rivers in this district are moved they may be flooded as a result of softening weather and rains. This condition would break up the ice in the river and also melt the heavy blanket of snow that lies in the mountains and in the valleys. Mills making tin plate for containers for perishable food, being exempt under the Garfield order, operated yesterday where it was possible to do so. Some mills have been down on account of a shortage of sheet bars, and also by reason of traffic congestion. The government continues to place orders and its requirements, it is reported, will involve extremely large tonnages in the near future.

Structural Awards Jump

December Lettings Second Best on Record Due to War Work—Airplane Buildings in France Call for Big Tonnage

New York, Jan. 29.—Coming within 3000 tons of the biggest monthly total in the history of the Bridge Builders and Structural society, structural bookings in December went beyond all expectations. According to the monthly statement issued by the society, December contracts aggregated 205,200 tons, or 14 per cent more than the estimated capacity of shops. The highest record ever announced by the society was for December, 1915, when orders amounted to 121 per cent. At that time, however, the estimated capacity of structural shops was 172,000 tons a month, as compared with the present monthly capacity of 180,000 tons. The gain made by December over the preceding month was 66,600 tons. Although it was known that several large contracts for ship steel were placed last month, estimates in the trade of late as to December bookings fell far short of the recorded tonnage. The scope of government buying in carrying out the various phases of the war program appears to have broadened beyond expectations. Following is a comparative statement:

Month	Per cent	Approx. tonnage
December, 1917	114	205,200
November	77	138,600
October	61½	110,700
September	29	52,200
August	38	68,400
July	41½	74,400
June	47½	85,500
May	56½	102,000
April	61	110,000
March	68	122,000
February	59	106,000
January	61½	119,000
December, 1916	86	148,000
November	78	134,000
October	77	133,500
September	52½	99,400
August	64	112,600
July	47½	83,600
June	58	100,000
May	80	137,000

Buying in the east at this time continues largely for government account. The J. G. White Engineering Co., which is in charge of the erection of various buildings at the nitrate plant at Mussel Shoals, Ala., has placed orders so far for 10,000 tons of structural steel, and still is in the market for an additional 2400 tons.

Government Taking Tonnages

Pittsburgh, Jan. 29.—The government is distributing additional tonnages to fabricators and those awarded during the past week are understood to have constituted a large quantity. Fabricators report that the great portion of their operations is devoted to government work, which is being placed directly by it in increasing volume, while that placed indirectly for it is not so great as it has been. It is understood that the Emergency Fleet corporation is about to place large requirements for shapes, one estimate running as high as between 150,000 and 175,000 tons. Fabricators are having no difficulty in getting steel because of the fact that their operations are principally for the government. Domestic business is extremely light due to several causes, among them being scarcity of steel and the high cost of material and labor and deferred shipments. Some fabricators are not taking orders and others are not actively soliciting business, their commitments for the first half filling their books comfortably. Fabricators have been exempt in part under the Garfield order.

Big Store Tonnage Placed

Buffalo, Jan. 29.—The T. Eaton Co., Toronto, the biggest department store in Canada has awarded the contract to the Dominion Bridge Co. for 8000 tons of structural steel for a mail order department building. This is in addition to plans calling for 22,000 tons of steel for a new retail department building held in abeyance until after the war. The Dominion Bridge Co. and McGregor & McIntyre participate jointly in a contract calling for the furnishing of 1800 tons of steel for a shipbuilding company in Canada.

Tank Tonnage Placed

Chicago, Jan. 29.—Absence of important structural lettings continues to characterize the market in the west. Slow mill operation is limiting delivery of plates and shapes to fabricators engaged on emergency ship work, but the effect of this probably will not be felt until some time later as present supply of finished material is probably sufficient for shop use for some days. Bids have been taken on 2000 tons of structural steel for a new building for the Western Union Telegraph Co. in Chicago, but the tonnage has not been awarded. No award of the steel involved in the Butler Bros.' warehouse has been made, this tonnage being about 9000 tons. The United States Smelting & Refining Co. has ordered 14 storage tanks, involving 330 tons, for use in Mexico.

Want Tonnages for France

Philadelphia, Jan. 30.—A slight improvement in the general structural demand is shown in this territory. Several small jobs which have been dormant since last year have been revived and figures have been asked upon them. Bids on heavy tonnages of fabricated new material for construction work in France have been asked by the government. For 500 airplane buildings 17,500 tons are asked, or 35 tons to each structure. Eight or nine buildings for army purposes in France, each requiring 425 tons, also are up for figures. An award of 4000 or 5000 tons for radial towers is reported to have gone to an independent shop.

Tonnage is Increased

Cleveland, Jan. 30.—Steel requirements of the new ordnance plant of the Morgan Engineering Co., Alliance, O., have been increased to 11,000 tons and the Bethlehem Steel Bridge Corp. has been awarded the contract for the entire amount. Fabricators continue to make sales in the general market from surplus stocks at prices between the mill and warehouse figures.

CONTRACTS AWARDED

Buildings for quartermasters department various locations, 3000 tons, to American Bridge Company.

Bridge work for Virginian railroad, 250 tons, to American Bridge Co.

Bridge work for Pennsylvania railroad at Monongahela Junction, Pa., 250 tons, to the McClintic-Marshall Co.

Bridge for Lehigh Valley railroad at New York, 250 tons, to McClintic-Marshall Co.

Government nitrate plant, Sheffield, Ala., awarded to American Bridge Co., increased from 8000 to 8500 tons.

Addition to the plant of the Wellman-Seaver-Morgan Co., Akron, O., 500 tons, awarded to the Canton Bridge Co., by George A. Fuller Co., general contractors.

Fourteen storage tanks for United States Stores Co., purchasing agent for the United States Smelting & Refining Co., 330 tons, to Kansas City Structural Steel Co.

Mail order department building for the T. Eaton Co., Toronto, 8000 tons, to the Dominion Bridge Co. New retail department building, 22,000 tons, held in abeyance.

Ship building construction in Canada, 1800 tons, to the Dominion Bridge Co. and McGregor & McIntire.

Radial towers for government 4000 to 5000 tons reported to have gone to independent.

Additional requirements of Morgan Engineering Co., Alliance, O., raising total to 11,000 tons, to Bethlehem Steel Bridge Corp. by George A. Fuller Co., general contractors.

CONTRACTS PENDING

Western Union Telegraph Co. building, Chicago, 2000 tons, bids being taken.

Bridge work for Southern railroad 800 tons, bids being taken.

Bronx bridge and repairs for New York Central railroad 250 tons, bids being taken.

Marine railroad, Boston and Charleston, 1000 tons bids rejected and will be readvertised.

Five hundred airplane buildings in France, 17,500 tons, bids being taken by government.

Eight or nine buildings for army in France, 425 tons each, bids being taken by government.

Heavy Demand

For Sheets Made Upon Valley Mills —New Business Small

Youngstown, O., Jan. 30.—Demand for all grades of sheets is extremely heavy among valley mills. New business is being booked in small quantities. A government order for about 2500 tons of black and blue annealed was taken by one maker whose rolling schedule has several openings at present on account of existing embargoes. Eastern and western shipments of sheets from Youngstown mills are still embargoed by all railroads, although as soon as the present cold spell lifts, it is announced, the restrictions will be modified. However, the Baltimore & Ohio railroad is dividing 100 cars daily among the mills for western movement and several tonnages for western consumers have already gone forward. Mills in the upper part of the valley are not restricted entirely and have been making western shipments.

Heavy Tonnage Being Taken

Pittsburgh, Jan. 29.—The government is buying sheets freely, its requirement for blue annealed and black sheets being unusually large. Mills are committed for the first half on these grades and for the first quarter on galvanized sheets, and are not selling additional tonnages to domestic buyers. Operations are perhaps lower than they have been at any time since 1914, some of the mills producing at the rate of not more than 30 or 35 per cent of their capacity, due to the shortage of steel and traffic conditions.

Light Gages Scarce

Chicago, Jan. 29.—Consumers of steel sheets find it difficult to place further contracts, especially for lighter gages, which appear to be sold out to a greater degree than heavier gages, especially in wide sizes. The leading independent in Chicago is entirely out of the market on light gages, but could book some tonnage for heavy sheets in wide sizes for second quarter. Demand for export continues heavy with domestic users also seeking material.

The blast furnace of the Robesonia Iron Co., Ltd., Robesonia, Pa., was blown out on Dec. 31 for repairs.

Ore Situation Tightens

Restrictions on Manganese Shipments by Brazilian Government Affect Ferromanganese Market—Producers Selling More Cautiously

Chicago, Jan. 29.—Shortage of ore and difficulty of transportation of the available supply already in this country are bringing about a dangerous condition in the ferromanganese market. Although no quotations over $250 per ton, furnace, have been made yet, so far as is known, it is probable that a higher price will come out shortly. Brazil seems inclined to release ore only in exchange for coal, which is badly needed in that country, and shipping to carry the ore to the United States is difficult to obtain. In the present railroad situation it is almost impossible for ore to be delivered and a trainload within a few miles of Chicago has remained unmoved for some time, as railroads are concentrating their efforts on coal and perishable freight. It is likely that the local producer may be forced to make spiegeleisen while the shortage of ore remains severe.

The government is aware of the situation and has refused to give export licenses for ferromanganese, which has caused cancellation of some tonnages sold at a much higher figure than the present market. Reduced operation of steel mills will give some reduction in demand, but this is temporary. The local producer is unable to take more tonnage for second quarter until conditions are relieved somewhat. Consumers are inquiring for last half, but selling for that delivery has not yet been started. It is believed possible that the government may limit ferromanganese producers to an alloy containing 40 to 60 per cent manganese in order to promote the use of low-grade ores available in this country.

Ferro and Spiegel Improve

New York, Jan. 26.—Inquiry for ferromanganese and spiegeleisen has shown an improvement recently. Several middle western consumers have put out inquiries for round tonnages for second quarter and the remainder of first half. None of this business has been closed. Apparently the minimum quotation which has been submitted is $250, delivered. The market is strong, due to the tight situation and the high prices prevailing in manganese ore. Spot lots of ferromanganese are selling at $250 to $255, delivered. Sales of English ferromanganese for first half shipment so far have been made only by one representative. The bookings by this interest for first half total about 5000 tons, about one-half of which was booked prior to this month. Large tonnages which for second half of 1917 shipment have been caried over to the first half. Additional inquiries have been cabled to England. It is apparent that the amount of this metal available from England, is limited.

In 50 per cent ferrosilicon the market is materially stronger. Demand for spot carloads is insistent and prices range from $175 to $180, delivered.

Many Locomotives

Under Orders to be Diverted to Eastern Lines by McAdoo

New York, Jan. 29.—Distribution of 4500 cars of various types which were recently bid upon at Washington has not as yet been made. These cars, which are for service in France, are similar to those awarded by the the road that ordered them.

Practically no inquiries are coming out from the railroads. A recent development of considerable interest is the order to locomotive builders by Director General McAdoo stipulating that all locomotives built on order in January, February and March should be turned over to specified eastern lines, regardless of government about a month ago.

The Chesapeake & Ohio is out for a number of 10-wheel switching engines; the Philadelphia & Reading, it is understood, will build 15 in its own shops; and the Illinois Central has ordered four Santa Fe types from the American Locomotive Co.

Railroads Show More Interest

Pittsburgh Jan. 29.—Slightly increased interest in the market for standard spikes is being shown by railroads. Inquiries are greatly below normal, however, both in number and volume. Demand is being made by several lines and one carrier is seeking 2000 kegs while others are inquiring for smaller or similar lots.

Some Rail Buying

Chicago, Jan. 29.—Small tonnages of standard steel rails for 1919 delivery are being booked by the western mill, but nothing of importance is developing along this line. Some small tonnages are also being taken for frog and switch manufacturers on which earlier delivery probably can be made, although ordinary business for 1918 cannot be taken.

Traffic Situation Improves Slowly

Recurrence of Severe Storms Holds Back General Betterment from Strenuous Remedial Measures—Pittsburgh Conditions Unprecedented—Open-Hearth Operations at 59 and Blast Furnaces and Coke Ovens 66 Per Cent Active

BEHIND the wall of embargoes and aided by the Monday shutdowns decreed by the government, the railroads continue to make strenuous efforts to clear their rails of the terrific congestion which has been paralyzing industry. While there has been a betterment in a spotted way, the iron and steel industry yet is to show any appreciable beneficial effects from the Garfield order. Heavy snows and a recurrence of wintry conditions of unusual severity during the past week, have, however, materially interfered with the realization of the full effects of the cessation of business. Conditions of river traffic at Pittsburgh and of snow drifting in the Allegheny mountains have been a factor contributing greatly toward further demoralizing production and transportation in the Pittsburgh and Connellsville districts.

Operating conditions in the Mahoning and Shenango valley and the Pittsburgh district for four days ending Jan. 27 show little improvement over the previous week. Blast furnaces and coke ovens in these districts operated at 66 per cent of capacity and open hearths at 59 per cent. This showing is considered extremely low by operators and is attributed to the cold weather and the difficulties experienced in getting the various units under way again after the 5-day suspension. Shortage of labor and cold weather are the chief factors affecting transportation in this district.

Railroad officials state if the present cold spell would end, they would experience little trouble in train movements, but that they are handicapped under present weather conditions. The Baltimore & Ohio railroad while not modifying their embargoes entirely has agreed to distribute 100 cars daily for western shipments only among the various iron and steel industries in Youngstown. The mills are requested to inform this road concerning shipments for the following day. By this agreement congestion of shipping platforms will be relieved somewhat since about 2500 tons of western shipments will be dispatched daily. The plan of dividing the country into zones for coal distribution as a possible remedy for the clogged condition of the railroads is welcomed by traffic managers. They contend this plan will not only help the railroads, but the coke ovens as well.

New England in Bad Way

The coal situation in New England was never more serious and unless relief comes within a very few days it is predicted industries by the wholesale as well as business generally will have to be suspended. Instead of 500 cars of coal a day being shipped to Boston, as promised, but 200 are coming, of which 150 go to public utilities corporations and the balance must take care of everything else. No coal of consequence is expected by water for two or three weeks. In Worcester, the Osgood Bradley Car Co., which has a $7,000,000 contract from the government for the making of gun carriages and was one of the plants exempted for the five days period shutdown indefinitely Jan. 23, for lack of coal to heat the various buildings. The New England Power Co., which supplies many Worcester and other New England industries with power, especially in the metal trades lines, has been obliged to borrow 1800 tons of coal from the Norton Co., to keep that and other plants from shutting down. In Bridgeport, Conn., Fuel Administrator Carl F. Siemon has appealed to E. B. Noyes, assistant federal administrator at Washington, to not grant any more exemptions to manufacturers in that city because he cannot take care of the 18 already so classified unless an immediate start of substantial shipments of both anthracite and bituminous coal is made. Bridgeport needs daily deliveries of at least 1300 tons of hard coal and 1000 tons of soft coal to take care of immediate requirements. The L. S. Starrett Co., Athol, Mass., maker of small tools, has shut down its plant because of the coal shortage. The company has been doing 100 per cent government work in the manufacture of delicate gun sights, etc. The Monday holiday closing order through the east is not believed to be helping conditions much.

Won't Allow Overtime

A ruling has been obtained from the coal administration in reply to the request of members of the Illinois Manufacturers' association to be allowed to work extra time the remaining five days of the week to make up to some extent the loss of time caused by closing their plants Mondays. The ruling is as follows:

"Any increase of the working time on other days of the week by industrial establishments for the purpose of making up the lost time brought about by the fuel administrator's order prohibiting work on Mondays, is considered by the fuel administrator an evasion of that order and a violation of its spirit.

"Signed P. B. Noyes, Director of Conservation."

More Fabricators Exempted

Exemption from the Monday closing order of the fuel administration has been granted a number of structural steel fabricating shops in Illinois which are engaged on material for shipbuilding under the direction of the Emergency Fleet corporation. These shops include the following: Chicago Bridge & Iron Works, Gage Structural Steel Co., Hansell Elcock Co., Kenwood Bridge Co., Morava Construction Co., Mohr & Sons, South Halsted Street Iron Works, Vierling Steel Works, all of Chicago; the Rock Island Bridge & Iron Works of Rock Island; William Graver Tank Works of East Chicago; Continental Bridge Co. of Peotone; Heggie & Sons of Joliet; the Decatur Bridge Co. of Decatur, and the plant of the Chicago Bridge & Iron Works, at Greenville.

Mining Meeting Called

On Feb. 18, 19, 20 and 21, the American Institute of Mining Engineers will meet in New York City. This will be its 116th meeting, and the main topic for discussion will be war work for the engineer and the concentration of effort to meet the country's mineral needs. Fifty technical subjects are to be discussed including economy of electric power over steam in mines; the extraction of gasoline from natural gas; erosion of guns; Chilean nitrate industry and various phases of the labor problem.

The Wisconsin Steel Co., South Chicago, Ill., has built a large lunch room for its employes. Hot meals will be served at moderate prices.

Concentrate War Duties

Appointment of E. Stettinius as Surveyor of Purchases Another Move Away from Unwieldy Management Without Legal Powers

WASHINGTON, Jan. 29.—Appointment of Edward R Stettinius as surveyor general of all army purchases is considered to have been a master stroke for Secretary Baker, storm center of the administration's war policies. It centralizes the war department's buying, a move long necessary, and it relegates further to the background the war industries board, in place of which a director of munitions is advocated both by leaders in congress and in the war board itself. It has been reported that Mr. Stettinius will only assist Col. Palmer E. Pierce, the official head of the new army purchasing system and a member of the war industries board, but in view of the former's wide experience, it seems certain that he is not likely to occupy a subordinate position. Other reports are to the effect that if the President is won over to a compromise on the question of a director of munitions and a three-man war cabinet, Mr. Stettinius will be in charge of what organization may develop from the compromise.

War Board's Position Wanes

It is an almost foregone conclusion Mr. Stettinius will not be bound by the red tape involved in the functioning of the war industries board. As Admiral Samuel McGowan has done in notifying steelmakers he intended to make certain purchases through the bureau of supplies and accounts for the navy without reference to the division of steel supply, so Mr. Stettinius is expected to do for the army. It is certain he will not let the head of any other division do anything that he can do himself.

With Admiral McGowan and Mr Stettinius each going his own way, consulting each other and others when they find their needs will overlap, it will be only a matter of time until the war industries board will have little to do. Most of the shipping board's urgent requirement having been placed and with most of the present orders calling for later delivery, it is altogether likely that board too will adopt an independent schedule.

This general trend argues against the war industries board and for a director of munitions. If each of the four war purchasing agencies is to go its own way, the need for their co-ordination under one authority is likely to become more insistent. The war industries board, as admitted by Secretary Baker, former Chairman Daniel Willard and B. M. Baruch, a member of the board, is only an advisory body. According to Messrs. Willard and Baruch it requires an organization similar to the food and fuel administrations, with authority and a responsible chief.

Buys for Five Divisions

Through Mr. Stettinius five divisions of the war department will make their purchases, ordnance, quartermaster, signal corps, engineers corps and medical corps. The ordnance and quartermaster bureaus are vitally affected. The other departments remain practically as they were. In ordnance, the chief's office, in charge of Brig. Gen. C. B. Wheeler, is subdivided into three bureaus, general administration, under Col. William S. Peirce, engineering under Col. John H. Rice and control under Col. Tracy C. Dickson. These three bureaus have concurrent jurisdiction over the operating divisions, procurement under Col. Samuel McRoberts, production with Col. Guy E. Tripp in charge, inspection under Col. Beverly W. Dunn and supply in charge of Col. Odus C. Horney.

Maj. Gen. George W. Goethals, who has announced changes in the quartermaster bureau, has placed R. J. Thorne, Chicago, in charge of the division of maintenance and distribution; A. L. Scott, Boston, division of clothing and supplies, and D. M. Lilly, New York, division of shipping. Under Mr. Scott, Col. John P. Wood will be in charge of the wool section; Daniel A. Lentz, Philadelphia, fuel, with Preston Davies, New York, as assistant; Col. H. M. Lord, finance division with Lieut. Col. James Colby assisting; and storage with Col. A. E. Williams in charge.

Corporation to Finance Government War Aid

Washington, Jan. 29.—The War Finance Corp., capitalized at $500,000,000, which has been proposed by Secretary McAdoo to congress will centralize all government financial aid to industries and to banks financing industries engaged in war work, according to views expressed here. The measure includes practically every line of new financing, such as shipyards, munition plants, machine builders, etc., except railroads which come under the McAdoo railroad control. All stock of the corporation would be subscribed by the United States. All new private financing would become subject to the approval of the corporation. Such issues would be limited to $[illegible],000,000. This undoubtedly would turn all financing into such channels as the government would wish and would prevent any interference with Liberty bonds and other war campaigns. Secretary McAdoo plans the secretary of the treasury should head the corporation and shall appoint four other members to manage it subject to the President's approval.

Will Allot Coal Output by Mine and District

Washington, Jan. 28.—The permanent systematic plan for the distribution of the country's bituminous coal supply, which the fuel administration is adopting, contemplates a system that will insure the speediest possible movement of coal from the mine to the consumer, and the immediate return of empty cars, according to an announcement. It will eliminate so far as possible cross-hauling of coal by providing for the movement along the shortest possible transportation lines.

Under the plan each state will be alloted its quota of the estimated output of bituminous coal. This allotment will be supplied from the output of certain definite producing districts. Coal for each state must move from the producing districts in which the states allotment is located and from no others. The producing fields of the country have been divided into some twenty districts and a district representative will be named in each of these. These district representatives will equitably allot all orders and requests for fuel from the fuel administration among the various shippers and mines within his district. They will be responsible for the prompt filling of coal orders and the prompt movement of coal out of the producing fields.

The whole system of coal distribution and apportionment will be under the general direction of J. D. A. Morrow, who has been appointed manager of apportionment and distribution. Representatives of the fuel administration and representatives of the railroads named by Director General McAdoo are now at work developing the phases of the plan which concern transportation.

Huge Earnings

Made by Steel Corporation in 1917—Cut Heavily by Taxes

Had it not been for the setting aside of approximately $235,000,000 for war income and excess profits taxes, the 1917 net earnings of the United States Steel Corp. would have aggregated $510,270,380, as compared with $333,625,086, the net earnings for 1916. Revisions of the 1917 figures may have to be made, when the corporation's official statement is issued. The net earnings, as given by quarters during the year, are as follows:

	1917	1916
First quarter*	$56,621,018	$60,713,624
Second quarter	90,579,204	81,126,048
Third quarter	68,243,784	85,817,067
Fourth quarter	59,724,125	105,968,347
	$275,168,121	$333,625,086
Set aside for excess profits*	235,102,259	
Total earnings	$510,270,380	$333,625,086

*Approximate.

Without the war income and excess profits tax, the net earnings would have been nearly $10,000,000 in excess of the outstanding common stock. Difficulties in transportation and the effect of price regulation are reflected in these figures. The balance for common stock dividends in the final quarter was equal to 7.44 per cent against 8.54 for the preceding quarter. Indicated earnings on common stock for 1917 were 46.3 as against 48.4 in 1916, and 9.3 in 1915. A detailed statement of the quarter's figures follows:

October		$21,835,991
November		19,902,862
December		17,985,272
Net earnings for quarter		59,724,125
Deprec. and sinking funds		11,688,781
Net income		$48,035,344
Interest and premiums on corporation's bonds		5,470,103
Balance		$42,565,241
Adjustment for credit		1,600,808
Total		$44,166,049
Prfd. divs.	$6,304,920	
Common divs.	21,602,857	27,907,777
Surplus		$16,258,272

Awards Decrease

In Structural Material During 1917—Fabricators Hold Yearly Session

New York, Jan. 28.—Due to the depression of commercial business which followed the United States' entrance into war, sales of structural shops fell off in 1917, according to a report by Secretary Gifford, presented at the annual meeting of the Bridge Builders & Structural society, Jan. 18. According to the figures set forth, total sales for 1917 amounted to 1,285,000 tons, compared with approximately 1,500,000 tons for both 1915 and 1916. In his address Secretary Gifford said:

The period of depression which has followed the entrance of the United States into war, causing the practical suspension of all the commercial business in fabricated steel, has resulted in the sales for the year 1917 falling considerably below those for the years 1915 and 1916. Our figures for the year, compiled from reliable sources with which you are all familiar, show that the total sales of fabricated steel for the year 1917 amounted to 1,285,000 tons, as against about 1,500,000 tons for both 1915 and 1916. This amount is probably less than it should be, because the collecting with accuracy of statistics on fabricated ships seems to be well nigh impossible.

The work of the society during 1917 went on with little or no change, so far as the operation of the open price plan with its attendant reporting features are concerned.

The effect of fixing of prices has not stimulated materially general buying, but this is due to government priority requirements which make it almost impossible for the general purchaser to secure deliveries, as well as the financial situation which makes it difficult or impossible to secure capital for commercial or speculative building.

Takes Washington Post

F. B. Richards, a partner of M. A. Hanna & Co., Cleveland, has joined the Cleveland contingent now doing war work in Washington. It is understood that he has been attached to the war department in an important capacity with the title of captain.

Ice Gorges

Threaten Damage to Iron and Steel Plants Along the Rivers

Pittsburgh, Jan. 30. (By wire.)—Great damage to iron and steel plants and tonnages that are stored, including tin plate, is threatened by tremendous gorges of ice which began yesterday to force their way down the Monongahela river.

Points along the line of water were on the verge of being flooded when a heavy ice dam formed at Brownsville, Pa., threatening the rush of ice floes and averting for the time being what promised to be one of the worst floods in the history of the district. The gorges began to break loose as a result of the moderating weather and rains.

The mantle of snow lying on the mountains and valleys was also added to the seriousness of the situation. The ice in the river is extremely thick and is said to be more than two feet in some points.

The Non-Ferrous Metals

Copper Lead Spelter Tin

New York, Jan. 29.—Monday of this week was altogether a workless day in the metal markets. The metal exchange was closed and brokers and dealers, profiting from their experience of a week ago, did not attempt to do any business. The week just passed was almost devoid of developments, the commandeering of further tin supplies from New York warehouse being the one feature attracting general interest. A few months ago the navy department ordered all tin in bonded warehouses analyzing 99.95 per cent or higher held subject to its requisition. The tin so held amounted to 800 tons. The Emergency Fleet corporation last week ordered all remaining supplies of all grades held subject to its requisition. As this metal is practically all owned by consumers, a strained situation is thus made more acute. Figures are not yet available as to the tonnage so commandeered or the price to be paid the former owners. No spot supplies of tin are yet available and so no spot market can be quoted. Some buying of future shipment Banca and Chinese grades is being done. Banca January-February shipment from Batavia sold last week at 69c, while Chinese No. 1 for January shipment from Hong Kong sold at 62c. Block tin has become extremely scarce, due to the lack of pig tin, the scrap metal going as high as 80c, according to reports. American spot tin, 99 per cent, was offered today at 78.50c, March shipment; Straits, 69.50c; January arrival of Banca, 85c.

The war industries board has not yet announced prices fixed on sheet zinc and high-grade spelter, despite expectations that such announcement would be made last week. Prices have been fixed and referred to the President, but this matter is understood to have been shelved temporarily pending congressional action on the price-fixing bill which in turn is said to hinge on the munitions cabinet legislation. Production of prime western spelter steadily is decreasing, but prices are unchanged at about the following levels: Prompt shipment, 7.70c to 7.75c, St. Louis; February shipment, 7.75c to 7.80c; March, 7.80c to 7.85c.

With the announcement by the war industries board of the continuation of the 23.50c price for copper until June 1, copper producers have begun to sell for deliveries in the second quarter. A good business was done for April, May and June the past week. The commission of 5 per cent on less than carload lots remains in effect.

Lead in the east has been rather scarce of late due to the traffic congestion and consumers have been paying considerable of a premium. Spot has commanded as high as 7.50c, New York, the past week, but this position now has been scaled down to about 7.25c, New York. Shipment inquiry is only fair, but prices are steady, as follows: Prompt, February and March, 6.87½c to 7.00c, St. Louis.

The antimony market is again easier, with only occasional consumer's demands in evidence. Spot Chinese and Japanese brands are obtainable at 14c, duty paid, New York.

Foundry Equipped in Record Time

How the Concentrated Energy of Four Men Enabled a Tractor Plant to be Converted Into a Modern Malleable Unit in 90 Days Despite Labor and Transportation Troubles

THIS is a true story. If it proves to be stranger than fiction, it is because American ingenuity has been compelled to go to great lengths in order to solve the complex problems of present-day industrial activity. The scene is Richmond, Ind., and the principal characters are four men who decided in 1916 to operate a malleable foundry.

In arriving at this decision, the four men took into account the unusual conditions prevailing at the time. It was clearly evident that the unusual demand for castings was far in excess of the existing productive capacity of foundries. The same activities which stimulated the demand for castings had the effect of slowing-up deliveries of other kinds of material. This feature of the situation made it necessary to devise ways and means of securing equipment in the shortest possible time and if the proprietors were to enjoy the benefits of the existing high markets, they could ill afford to lose time in getting the new foundry under way.

Utilize Tractor Plant

Therefore, when the question of building was considered, they eliminated the possibility of erecting a new foundry, and promptly decided to purchase a plant already built which would be suitable for their purpose. After investigating a number of factory buildings, they chose one which had formerly been used for making agricultural tractors. This plant was situated near the business district of Richmond, Ind., on the main line of the Pennsylvania railroad. It consisted essentially of a large brick and wood building of mill construction, having a high roof, and was unusually well lighted by large areas of sash in the side walls and cupola. Most of the sash in the cupola were pivoted, thereby affording good ventilation. This large building appeared to fulfill the requirements of a model molding room for a malleable foundry.

The deal by which the old tractor plant was acquired was negotiated Nov. 1, 1916. Two of the four men, who had been associated with one of the largest manufacturers of malleable castings in the United States, immediately assumed the task of putting the building in shape for foundry purposes. They found it necessary to tear up the floor in the main building, to install an automatic sprinkler system throughout the plant, to make a number of alterations in the roof construction of the main building, and to build a structure adjacent to this building for the installation of the annealing ovens and core room. In general, it was not necessary to make any radical changes in the large building which was to be used for the foundry proper. As shown in Fig. 1, which is a view of part of the molding floor, it was only necessary to install the wood stalls separating the molding floors. These are clearly shown in the illustration. Each molding floor was equipped with a hand squeezer made by the B. & B. Mfg. Co., Indianapolis, and snap flasks made by the Diamond Clamp & Flask Co., Richmond, Ind. The entire plant was then piped for compressed air and water. The air lines were supplied with air at a pressure of from 60 to 65 pounds per square inch by a Chicago Pneumatic Tool Co. air compressor situated in the southeast corner of the building.

The 10-Ton Furnaces

It was found necessary to make slight alterations in the building to accommodate the melting equipment. Profiting by their experience with the large manufacturer of malleable castings, the two men designed a type of 10-ton air furnace best adapted to their purpose. One of these units is shown in Fig. 2. Each furnace is essentially of the approved design commonly employed in malleable foundries, but is of unusually substan-

FIG. 1—VIEW OF THE MOLDING FLOOR IN THE RICHMOND MALLEABLE CASTING CO.'S PLANT RICHMOND, IND.

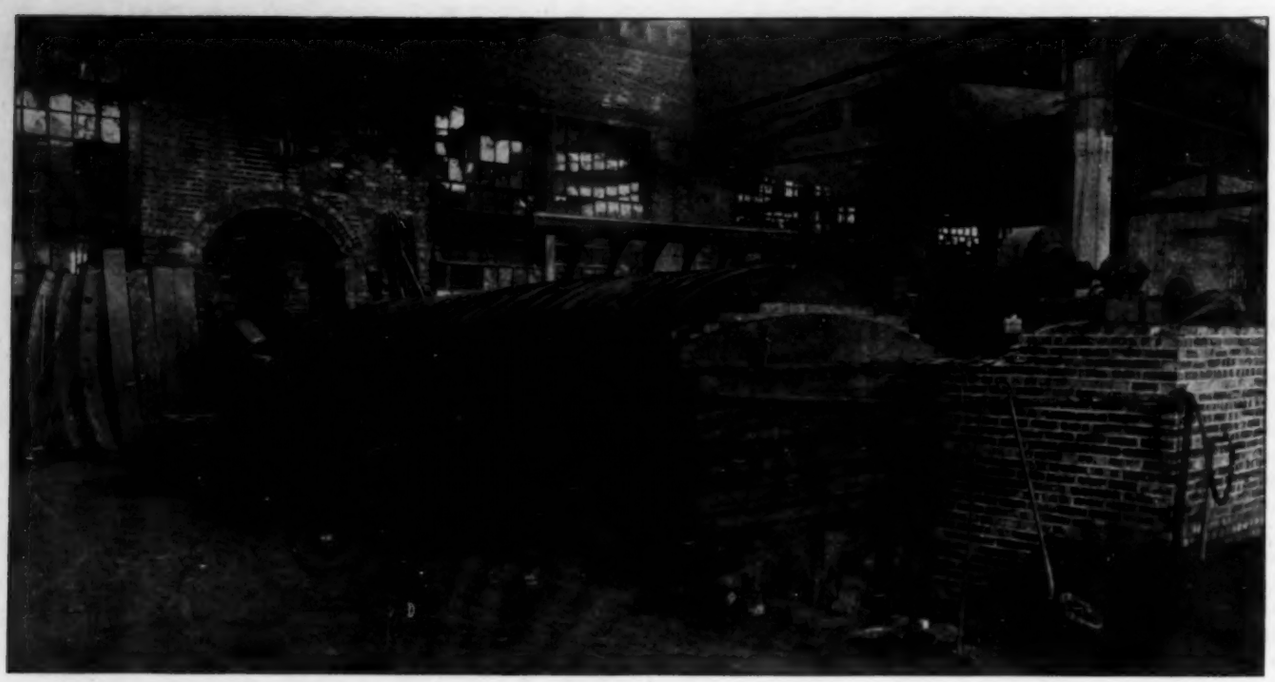


FIG. 2—ONE OF THE TWO 10-TON AIR FURNACES—THE BLAST PIPE EXTENDS UNDERGROUND FROM BLOWER TO FURNACE

tial construction. Brickwork is encased in heavy castings held in place by vertical steel rails anchored in the ground. The blast enters the furnace through five nozzles connected to a blast pipe which passes underneath the molding floor, thereby overcoming the objection of having an overhead pipe obstructing the headway over the furnace. A centrifugal blower manufactured by the Clarage Fan Co., Kalamazoo, Mich., provides blast for each 10-ton furnace. These fans are driven by individual 10-horsepower, 60-cycle, 3-phase motors, made by the General Electric Co., Schenectady, With the exception of the two double bungs, each bung is made of a single reinforcing forging, a single row of refractory fire brick, and a single adjustment device of the lever type. The double bungs which are removed for charging the furnace, consist of two of the ordinary single bungs bolted together at three places. The center bolt serves as a catch for the hook of a 1-ton chain hoist made by the Wright Mfg. Co., Lisbon, O., which traverses an I-beam suspended from the roof trusses. This arrangement is clearly shown in the illustration. The rectangular brick structure at the right serves as a bin for the coal which is used for fuel in the furnaces. The ashpan is shown in the foreground. The furnace is charged at about 7 o'clock in the morning and at 12:30, and pouring is commenced at about 11 o'clock in the morning and about 4:30 in the afternoon. The metal is tapped from each side of the furnace and is carried direct to the molds in small distributing ladles. The pour-back platform is shown at the left of Fig. 2. Skimming doors are provided on either side, as indicated in the above illustration. Unusually serious difficulties were encountered in attempting to build the addition in the foundry to house the annealing ovens. It was found that steel could not be secured in less than six or seven months, and when local lumber dealers and contractors were approached on the subject of providing large timbers on short notice, they replied that it was necessary to order the lumber from Alabama and that it could not be secured in less than six months. Rather than be balked by these obstacles, the president of the newly-formed company, accompanied by a gang of 10 men, went into the woods near Richmond and there they cut and shaped the timbers which were used as roof trusses for the new building. This expedient saved many months in the period required for constructing the new building, and was one of the factors which enabled the builders to complete construction work promptly. The heavy roof truss construction is clearly shown in Fig. 3, which is a view of four large ovens in the annealing room.

FIG. 3—AMPLE CAPACITY FOR ANNEALING CASTINGS IS PROVIDED BY FOUR LARGE OVENS

FIG. 4—VIEW IN THE CORE ROOM SHOWING ECONOMICALLY CONSTRUCTED RACKS AND CORE OVENS

The core room, hard iron cleaning room, annealing ovens, soft iron cleaning room and shipping department, are in a large room in the new building paralleling the molding floor. As shown in Fig. 7, which is a plan of the foundry, this arrangement provides for a steady movement of the castings in a straight line as they progress through the various stages of manufacture.

In the hard iron cleaning room, the castings are cleaned by a combination sand-blast and tumbling barrel made by the MacLeod Co., Cincinnati, and tumbling barrels made by the W. W. Sly Mfg. Co., Cleveland. The dust from this equipment is collected in a MacLeod dust arrestor shown in Fig. 6. Castings which have been annealed are cleaned by the sand-blast barrels and tumblers all made by the W. W. Sly Mfg. Co., Cleveland.

The Annealing Ovens

The annealing ovens are of the type shown in Fig. 3. The four ovens are coal-fired from fire boxes at the rear. Hot gases from over the grates enter the annealing chamber at the top and circulate downwardly over the castings and are exhausted through adjustable vents near the floor. The doors are made in four sections, each of which consists of a double row of bricks securely packed in heavily braced channel iron frames. Pending the arrival of a crane which will operate on the I-beam shown in Fig. 3. it has only been possible to move the two smaller sections of the doors into place. This has necessitated building-up the additional opening with common brick and tearing this out after each heat. When the new crane is in place, any one of the four sections of the door can be handled easily. The charging boxes containing the castings are handled by the charger shown in the illustration. As indicated in Fig. 7, the core room is in the northeast corner of the building. Coremakers' benches are situated along the east wall, while the core oven and the core storage racks occupy the west section of the room. The core racks have proved of unusual value in handling the light cores used in the foundry. They consist of two standards of wood, drilled for 1-inch pipes which serve as racks for core trays.

The arrangement of the various departments of the foundry is ideal for the economical handling of material. As shown in Fig. 7, the raw materials consisting of coal, pig iron and scrap enter the foundry proper at the west. Here the materials charged into the furnace are placed on wood trucks, as shown in Fig. 5. It will be noted in this illustration that a few of the trucks are numbered on the side. These numbers, which in one case is 385 and in the other 392, refer to the number of pounds

FIG. 5—CHARGES FOR THE AIR FURNACES ARE CARRIED FROM THE STORAGE YARD TO TRUCKS

of a certain material which should be placed on the truck. The truck, with its approximate weight of charging material, is placed on a platform scale made by the Fairbanks Co., New York, and is then hauled to the furnaces for charging. It is expected that in a short time these trucks will be handled to and from the storage yard and the furnaces by an electric storage battery truck. The castings in the cleaning room are handled in the steel barrels shown in Fig. 6. These barrels are made by the Ohio Mfg. Co., Painesville, O.

Sorting the castings after they have been cleaned in the annealed iron cleaning room, is a difficult problem because many of the pieces are of unusually small dimensions. A recent order filled in the foundry called for 50 tons of small chain links. As each of these links weighed 0.04 pound, there were 2,500,000 pieces in this single order. To facilitate the sorting of the castings, an inspection and sorting bench has been provided in the shipping room. The castings are taken from boxes on either of two sorting benches and are thrown into receiving boxes which are placed in a row between the benches.

The installation of equipment and machinery, although offering many difficulties, was accomplished in an unusually short time. The most serious stumbling block to the rapid formation of an efficient organization was the scarcity of labor. Long before the plant was ready for operation, it became necessary to scour the country for good molders. After considerable effort in this direction, it was found advisable to offer an inducement to molders who would become steady workers in the new plant. Accordingly, men were brought to Richmond from other labor centers with the understanding that houses would be provided for them and their families and that the rent would be paid by the company. This plan proved so successful in the earlier stages, that the company has adopted it in a general way. The fact that the company pays the rent is not allowed to have any bearing on the amount of wages paid the men. This policy, together with the knowledge that as soon as the man leaves the employ of the company his rent automatically stops, has been an important factor in building up a permanent and reliable labor organization.

In addition to the inducement that is offered because of the rent-paying proposition and because of the unusually good working conditions obtaining in the foundry, the proprietors endeavor to make the wages attractive to workers. Molders who come to the Richmond shop for work and are accepted are put to work on a day-work basis. An accurate record is kept of the production of molds for each day, and as soon as a man acquires the skill and speed necessary to turn out a sufficient number of molds to make more money at piece work than he is already making at day work, he is placed on a piecework basis. There is no tendency on the part of the owners of the foundry to interfere in any way with the amount of money a molder can make. It is felt that the extra production warrants the highest amount that a man can possibly make.

Most of the castings made in this foundry consist of light and heavy hardware parts, wrenches, clamps, parts for hay-carriers, automobile castings and parts for lawnmowers.

In spite of the difficulties encountered in perfecting this organization and installing the equipment, the plant, which was acquired Nov. 1, 1916, was ready for operation Jan. 31, this year, and on this day the first heat was successfully poured. This performance, which in reality means that a complete malleable foundry was put in operation in 90 days, was due principally to determination of the men interested to avoid and overcome the obstacles imposed by present-day deliveries of material.

The details of the organization were worked out by W. J. Blackmore, secretary and general manager, and C. D. Calvelade, superintendent. J. M. Lontz, president, and H. R. Lontz, vice president and treasurer, were also responsible for overcoming many of the difficulties encountered in selecting and installing equipment.

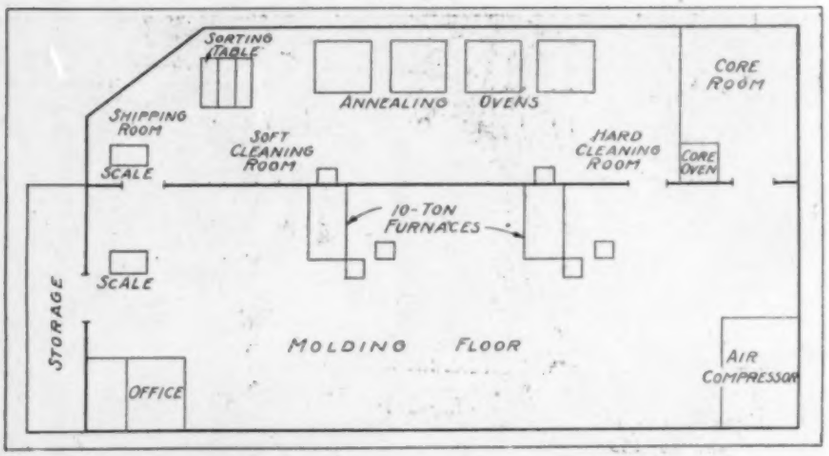


FIG. 7—PLAN VIEW OF THE RICHMOND MALLEABLE CASTING CO. FOUNDRY

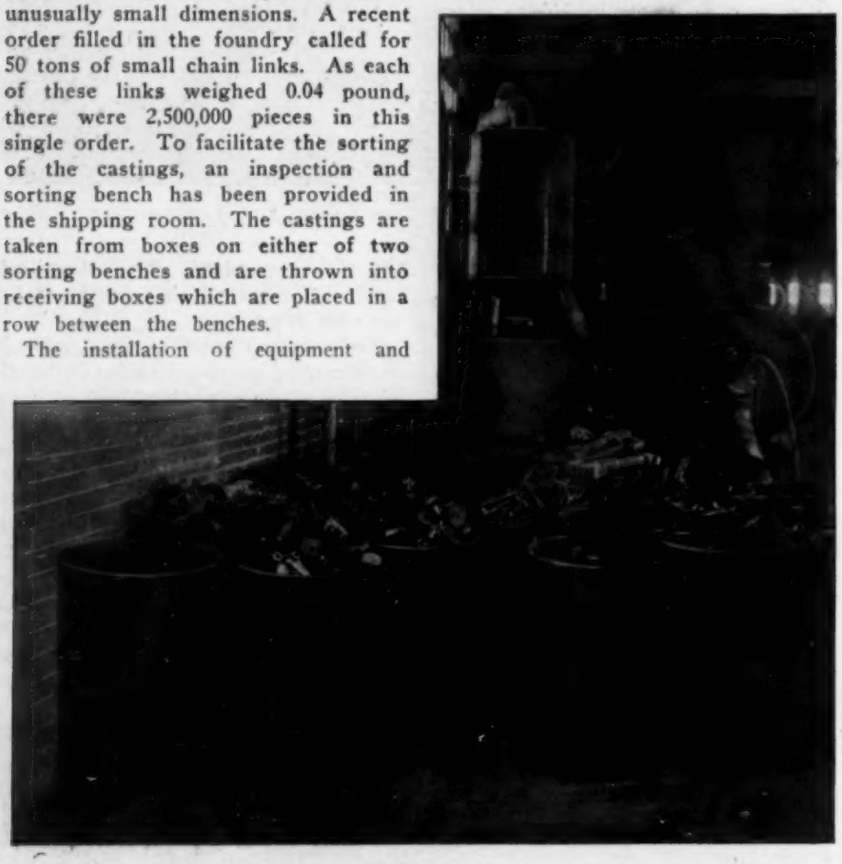


FIG. 6—CASTINGS ARE HANDLED IN THE CLEANING ROOMS IN STEEL BINS

Shunt-Wound Reversing-Mill Motor

A New Drive Installed at the Plant of the Ashland Iron & Mining Co. Develops Unique Principles of Design in Electric Rolling-Mill Practice

THE first large reversing mill-motor received nation-wide attention because of the field it opened for further applications. Since the inception of the first reversing mill-motor, so many similar equipments have been installed in steel mills that alternating current, motor generator sets functioning through direct current reversing motors to the mill have become the predominating type of motive power. Although subsequent sets have been built with greater capacity and have been designed to perform under conditions slightly different from those existing at the plant of the Central Steel Co., Massillon, O., where the first unit was installed, the same fundamental principles of design have been followed. It is interesting, therefore, to study a new reversing equipment which embodies some unique modifications. This new equipment, designed and built by the General Electric Co. and installed at the plant of the Ashland Iron & Mining Co., Ashland, Ky., operates a 36-inch blooming mill. It is the first large unit of this type built at Schenectady. The most unique feature is the use of shunt winding on the mill motor, which does away with compounding.

The manufacturer's contract called for equipment having capacity for 60 tons of 4 x 4-inch billets per hour from 7000-pound ingots. It was understood, however, that occasional demand would be placed on the mill for heavier ingots. Power purchased by the consumer from a central station is transmitted to the plant as 3-phase, 6600-volt, 60-cycle current. Interposed between power supply and the flywheel, induction-motor generator set is a liquid slip regulator of usual design that is connected in the secondary circuit of the induction motor, thus providing for automatic retardation and acceleration of the flywheel. This ameliorates the peak demands of the mill during and between successive passes. The motor is rated at 1500 horsepower, 360 revolutions per minute, 6000 volts; and the generator, 2000 kilowatts, 360 revolutions per minute, 500 volts. The flywheel weighs 100,000 pounds. An unusual characteristic, somewhat contrary to general practice, is to be found in the full automatic magnetic current-limit control for starting and for plugging the flywheel set for the master controller. This limit control is employed in emergencies for stopping the flywheel set. This permits normal starting and stopping through the movement of a single master controller. In emergency it is said the set may be brought to rest within a period of four to five minutes.

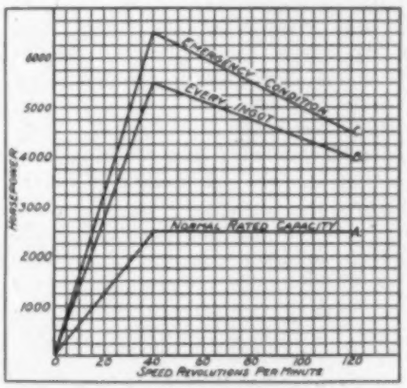


FIG. 1—HORSEPOWER CURVES OF 22-POLE, 2500-HORSEPOWER, 500-VOLT MOTOR

The main roll motor has a continuous rating of 2500 horsepower, while the speed variation is from 40 to 120 revolutions per minute. The maximum temperature rise is guaranteed not to exceed 50 degrees Cent.

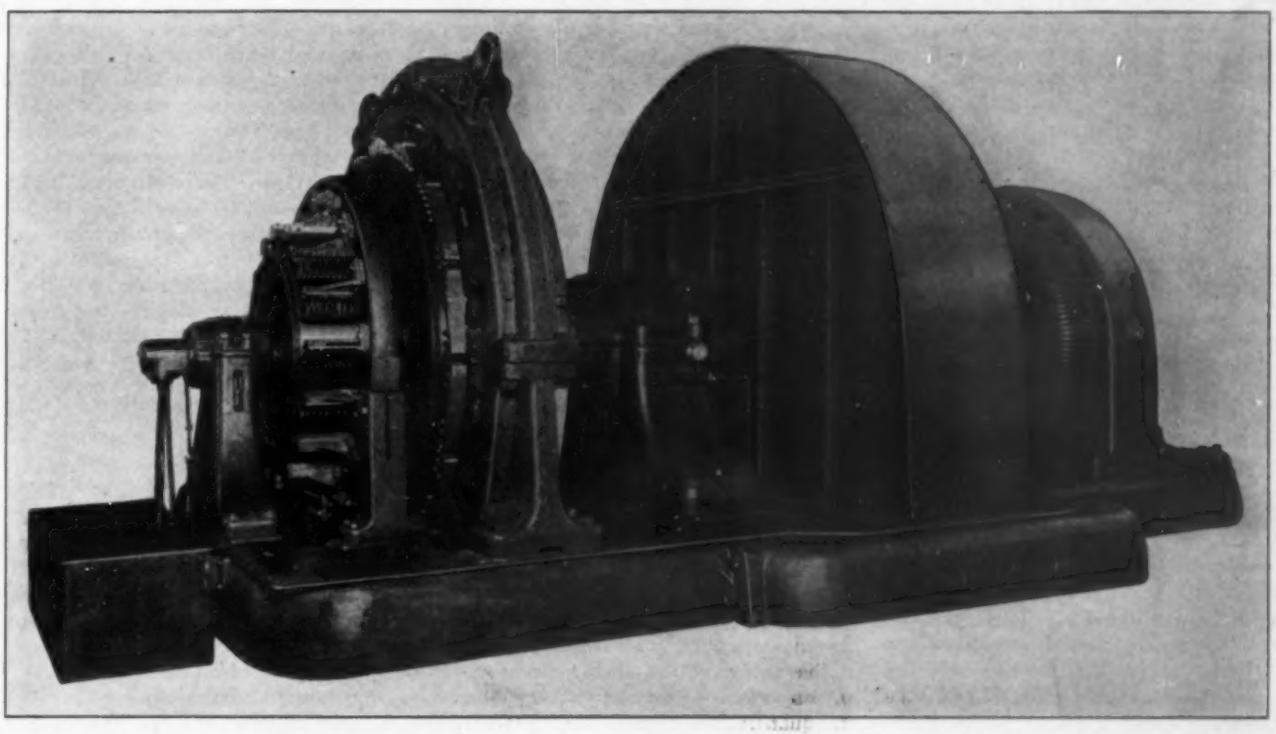


FIG. 2—FLYWHEEL MOTOR GENERATOR SET WITH 2000-HORSEPOWER, 2300-VOLT MOTOR AND 2000-KILOWATT GENERATOR RATED AT 360 REVOLUTIONS PER MINUTE—FLYWHEEL WEIGHS 100,000 POUNDS

Fig. 1 is a curve indicating guaranteed values of horsepower for a continuous load, continuously recurring cycles and emergency conditions. Tests made in the factory under actual operating conditions served to demonstrate that the maximum momentary guaranteed value horsepower was conservatively given, since the question of maximum momentary rating is one chiefly of commutation. Momentary peak loads of approximately 14,000 amperes at 650 volts, corresponding to 10,500 horsepower at 50 revolutions per minute have been observed, while rolling billets, without appreciable sparking at the commutator. The guaranteed emergency torque was 850,000 pounds at 1 foot radius up to 40 revolutions per minute, but 1,100,000 pounds torque have been developed by the motor.

One feature of the motor is its acceleration characteristics. Complete reversal from 120 revolutions per minute forward to the same speed in the opposite direction may be obtained in approximately 5½ seconds; complete reversal at 50 revolutions per minute may be accomplished in two seconds. The motor may be rocked backward and forward in its bearings through an arc of approximately 12 degrees as rapidly as the master controller can function—from 50 to 60 oscillations per minute.

The fully compensated shunt winding and the elimination of compounding, which is almost universally used, accounts largely for satisfactory speed characteristics. Compounding affords protection to the motor but incidentally is said to give a drooping speed characteristic and consequently a sluggish drive as compared with a simple shunt machine. The equipment for the shunt-wound motor is further simplified by the elimination of the series-compound exciter as well as by the absence of the series field of the motor itself. Due to the intermittent character of the load, low average speeds and idle intervals, forced ventilation is supplied. Provision is included for washing and humidifying the air before it enters the motor.

In addition to this reversing drive and its auxiliary equipment, the General Electric Co. is furnishing for the Ashland company a 4000-horsepower, 83-revolutions-per-minute, 6600-volt, constant-speed induction motor for the new 140-inch plate mill, and an 1800-horsepower, 370 and 247-revolutions-per-minute, 6600-volt, adjustable-speed induction motor for the new 24-inch bar mill now under construction.

The flexible speed control of the induction motors for bar mills is of especial interest. It consists fundamentally of the double-range Sherbius system with modifications introduced by the builder. The motor has a synchronous speed of 300 revolutions per minute and at the discretion of the operator may be run as a simple, constant-speed induction motor with the auxiliary speed regulator set idle. It is possible to operate the mill normally at this speed with the auxiliary regulating set cut out, but for rolling sections requiring higher or lower speeds, the set is cut in by throwing a switch and any speed within the range of the set is obtained by a push botton controlling a pilot motor field regulator.

With this system, practically constant horsepower is obtained at all speeds. The speed is adjustable and practically constant under varying load for any setting of the controller; and without the regulating set in service, the synchronous speed point disappears giving strictly uniform speed adjustment at and near the normal synchronous speed point as well as at more remote points without sacrificing the maximum forque features.

Facts About War-Work Fatigue

AT THE outbreak of the war in 1914, the laws governing the hours of labor in the British munition factories were generally abrogated. The work was speeded up to a degree which made 80, 90 or even 100 hours of work a week by no means uncommon. The resulting discontent and the wide increase of excessive fatigue led to the establishment in 1915 of a health and munition workers' committee under the British ministry of munitions.

Investigations Not Complete

This committee, and other government agencies, has studied the relation of output to fatigue. These investigations are by no means complete, but a number of preliminary or progress reports have been published. The national industrial conference board, a co-operative body of American industrial associations, has published a short analysis of some of these British reports. The principal studies of the health of munition workers' committee were conducted by Dr. H. M. Vernon of Oxford university.

Dr. Vernon's reports definitely indicate that exceptionally long work schedules are not economical. The output from men working 70 or more hours per week was, in almost every case, less than that obtained under much shorter hours. For heavy labor performed by men, involving considerable hand work, the reports show that maximum output is secured from about 51 hours per week. For moderately heavy work performed by women, the reports show that maximum output is secured from 55 hours per week, but it is indicated that somewhat shorter hours would yield equal production. For lighter work, chiefly of the machine type, performed by women, 55 hours per week leads to maximum output, but Dr. Vernon contends that a moderate reduction of hours would not involve a serious decrease in production. Only the actual number of hours worked, after deducting the time lost because of tardiness, absence and minor interruptions, was considered in arriving at the foregoing conclusions.

The value of the investigation lies in its broad suggestion rather than in quantitative result. It indicates that reduction in work hours within certain limits does not decrease output, but on the contrary for some classes of labor actually increases production. Before establishing the number of hours in which a maximum production may be obtained, it is necessary that there shall be a much broader observation under more normal conditions. Normal conditions would of course eliminate such factors in the present production as patriotism, high piece-rates, the novelty of the work to many workers, and the noninterference of trades unions under the existing open shop arrangement.

Definite Recommendations

An upper time limit for the hours of work per week was recommended by the committee as follows: For men the average hours per week should not exceed 65 to 67 including overtime. For boys the same limit should prevail with the urgent suggestion, however, that 60 hours ought to obtain. For women and girls work in excess of 60 hours per week was strongly condemned.

In the investigation of the committee, the output was regarded as

the most satisfactory measure of fatigue, which it defined as the "sum of the results of activity which show themselves in a diminished capacity for doing work". Fatigue was compared not "with the failure of fuel as in a steam engine or with the running of a clock weight, but rather with the clogging of the mechanism by dirt". The following principle was stated:

"It is of vital importance for the proper study of industrial fatigue, however, to recognize not only that bodily sensations are a fallacious guide to the true state of fatigue which may be present, and a wholly inadequate measure of it, but also that fatigue in its true meaning advances progressively, and must be measurable at any stage by a diminished capacity for work, before its signs appear plainly in sensation. Industrial fatigue is fatigue of the nervous system, though in sensation its effects may be referred to the muscles themselves."

Long Hours Caused Sickness

The results of the committee's investigations showed very favorable conditions. This was surprising when it is considered that the war drew from industry into active service a large percentage of the strong and virile, and forced the employment of many of the less robust. The extremely long hours at the beginning of the war caused a certain amount of sickness, particularly among foremen and executives; but with the reduction of hours of work sickness due to fatigue was less evident. Patriotism and the better food and clothing incident to the higher wages no doubt contributed in no small degree to the good health under extra long hours.

All British investigators agree in recommending rest periods during the working day. It is suggested that these rest periods should be arranged and regulated and not left to the inclination of the worker. This is in order that the periods may not be disregarded through a desire to make more on the piece work plan. Where periodical rest is enforced the output per hour is actually increased. Rest pauses are regarded by the committee as especially important for women, and recreation in the open air for those engaged in sedentary work is strongly urged.

Coal—The Measure of a Nation's Power

SINCE the introduction of the first "metallic operations by fire" the lust for coal has been at the bottom of many wars of conquest. Some of our best historical scholars inform us that this coal greed is back of Germany's vicious attack on France, and that her running amuck through Belgium was a carefully planned confiscation of the coal fields of that prosperous little nation, as well as a "military necessity." Coal means power. The lust for coal has been uppermost in Germany's mind since her first conception of *der Tag*.

Viewed in the light of the struggle for national supremacy, the question of coal assumes a live interest and figures of production mean a measure of power by which nations may be gaged. In a paper to be read before the American Institute of Mining Engineers at a meeting in New York in February, George S. Rice recites some vital facts in connection with the coal situation.

In 1913, the last year in which a comparison may be obtained, the United States produced 40 per cent of the coal of the world. Great Britain was second and Germany third in production. Great Britain, the United States, and Germany were all coal exporting nations. France ranked fifth in production previous to the war, but the invasion not only caused a loss in coal production and mining property, but entirely cut off the chief by-product coke plants of the country. These would have been invaluable to the allies for the production of high explosives early in the war.

Germany's first thrust carried her armies down to the coal beds of northern France, which extend easterly through Belgium and into Germany. Here the Hun sat down according to the prearranged war plan, hoping to stifle resistance by holding the coal necessary to all industry. The battle line crosses the coal field from north to south originally through Loos to Arras. The latter, although south of the coal basin, was formerly headquarters of the mining district. This battle line was forced eastward last spring over Vimy Ridge which marks the southern boundary of the basin, and it now partly surrounds Lens, which was the largest French by-product coke center. During the time this possession has been maintained, the removal of coal throughout Belgium has been carried forward by the Germans, largely with forced civilian and war-prisoner labor.

United States is Handicapped

The coal resources of the world are unevenly distributed the United States having more than its share, while production is more unevenly divided, depending on the position of the coal supplies with regard to markets, the quality of the coal, and its accessibility. Great Britain has developed its coal supply to the greatest extent, for the reason that some of the finest grades, notably the Welsh steam coals, are found within a few miles of seaports. Germany and the United States are both handicapped by the long rail haul necessary for shipping, but Germany has had a slight advantage, due to the government ownership of the railroads which gave active aid to exporting. The other handicaps under which the United States has labored are the absence of shipping, the small amount of available dockage, and the lack of care in preparing coal for shipment, particularly in the matter of sizing. With the coming of war, the output of the United States promised to be far greater, but the shortage of railroad cars and labor troubles caused a falling off in output during 1917.

To offset the handicaps imposed by shipping conditions, the coal of the United States is mined with much greater ease than in other countries. The coal beds of Europe, particularly those in Belgium, France and Germany are badly broken by faults, the coal is more or less crushed, and occurs in thin beds which are deep in the earth. These difficulties have, however, served to develop the art of mining in Europe far ahead of American practice. There is waste in mining in this country. Only the most accessible coal is taken and the thin and irregular veins are left. In many cases the pillars are not extracted because their removal would mean an added expense which has not been compensated by low coal prices. The miners' unions have contributed to make this wastage necessary as they have insisted on unified wages on the basis of the most easily extracted coal, and inferior conditions are so severely penalized that the operators cannot afford to introduce new or improved mining methods. This shortsightendness of labor coupled with the difficulties of conveyance and shipping are co-operating at this time to prevent the United States from stepping far ahead in coal production and export.

It is asserted that there are enough men to produce the greater amount of coal needed at this time, if the miners could and would work every day. The former condition depends mainly on the car supply; the latter refers to the willingness of the men to stay on the job every day when work is possible.

Mechanical Tests on Copper Steels

Steel Bars of 1-Inch Square Cross Section Were Used in the Elongation Tests —For Tests After Heat-Treatment Round Bars Were Used —Results of Tests Are Shown in Full

BY C. B. HAYWARD AND A. B. JOHNSON

BEFORE modern testing methods had been developed, blacksmiths noted red shortness in iron, the cause for which was ascribed to the presence of copper. Numerous papers have been published on the corrosion of steels containing various amounts of copper and a few writers have discussed the effect of copper on the mechanical properties of steel. Among those who have published results of mechanical tests on copper steels are Ball, who states that copper increases the tensile strength and hardness but lowers the elongation. Stead states that copper steels closely resemble nickel steels containing equivalent percentages of nickel as regards tensile strength, resistance to shock, corrosion and hardness. Wigham found that copper in small amounts had no injurious effects on steel. Breuil found that with 1 per cent carbon, copper lessened the brittleness of steel and in low-carbon steel it increased the tensile strength and lowered the ductility slightly. H. H. Campbell states that copper up to 0.25 per cent slightly raises the elastic limit, elongation and reduction of area. It will be noted that all the writers agree that copper increases the tensile strength, but they disagree in regard to the ductility. There is little to be found on resistance to shock.

Materials Used

The steels used were furnished in the form of forged bars about 1 inch square in cross-section and of varying lengths. There were three bars of one composition marked Nos. 41, 42 and 43 and four bars of another composition marked Nos. 51, 42, 53 and 54. The chemical analyses furnished with the steel are as follows:

	Nos. 41, 42, 43	Nos. 51, 52, 53, 54
C	0.380	0.365
P	0.012	0.053
Mn	0.570	0.590
S	0.030	0.048
Cu	0.860	0.030

It will be noted that the analyses vary only slightly except in P and Cu, and it is probable that the effect of P will be neutralized by the slight difference in C.

Although 0.86 per cent Cu is not in general considered high, for the purpose of disignating the steels in this paper, the first will be called high-copper and the second will be called low-copper.

The bars were first cut to 7½-inch lengths. The cutting was done with an ordinary reciprocating mechanical saw. Three of the bars gave five specimens each, while the fourth bar, which was somewhat longer, yielded six specimens. This made a total of 21 7½-inch specimens of low-copper steel. Each of the other bars yielded seven specimens, making a total of 21 7½-inch high-copper specimens. The bars were now square, but as this form was not the most favorable for heat treatment, it was decided to turn them down round, on a lathe, in order to obtain the most uniform heating in the furnace. As the threads for the tensile specimens would eventually have to be cut on a ¾-inch round bar, it was decided to turn the 42 specimens down to this size prior to treatment. The steel as forged was fairly soft and turned easily on the lathe. There was no noticeable difference in the speed of cutting, between the high and low-copper steels.

Three specimens of high-copper and three specimens of low-copper steel were taken for each test and in order to eliminate possible differences in the bars no two specimens in a set were taken from the same bar except in one or two instances. There were seven different heat treatments, and in order to identify the specimens the numbers 1 to 7 were prefixed before the original number of the bars.

Table I

Shock Tests of Copper Steel Specimens

Section of specimen	Per cent copper	Average breaking force ft.-lbs. per sq. in.	Average Brinell No.	Average Scleroscope No.
1	High	288	176	20
1	Low	246	149	16
2	High	240	158	18
2	Low	*173	135	15
3	High	327	171	18
3	Low	242	153	16
4	High	...	444	45
4	Low	...	241	26
5	High	128	350	39
5	Low	127	243	29
6	High	254	311	35
6	Low	231	233	26
7	High	358	254	29
7	Low	285	211	24

*Not averaged because of defect in specimen.

Cooling Method

The six bars of section 1 were reserved for tests without heat treatment. The bars under section 2 were heated to 765 degrees Cent., the switch was pulled, and the final temperature rise registered due to residual heat was 865 degrees Cent. The bars were allowed to cool in the furnace over night, and removed next morning. The bars under section 3 were heated to 765 degrees Cent., the switch was pulled, and the final temperature attained due to residual heat was 860 degrees Cent. They were then removed and set inclined against a brick on the cement floor to cool in air. The bars under section 4 were heated to 765 degrees Cent., the switch was pulled, and the final temperature attained due to residual heat was 845 degrees Cent. They

Table II

Physical Tests of Copper Steel Specimens

Treatment	Yield point lbs. per sq. in. High Cu	Yield point lbs. per sq. in. Low Cu	Ultimate strength lbs. per sq. in. High Cu	Ultimate strength lbs. per sq. in. Low Cu
Cooled in furnace	52,900	45,800	86,530	78,130
Cooled in air	64,300	53,000	90,300	84,700
Bars as forged	60,900	46,600	92,600	83,200
Drawn at 580 degrees Cent.	110,600	80,000	123,700	109,600
Drawn at 455 degrees Cent.	136,900	100,000	151,500	129,300
Drawn at 360 degrees Cent.	130,000	100,000	190,800	136,300
Quenched at 825 degrees Cent.	?	110,000	(207,000)*	135,900
	Per cent reduction		Per cent elongation	
Cooled in furnace	49.0	46.2	26.0	26.7
Cooled in air	52.7	52.7	27.3	27.3
Bars as forged	52.7	50.9	24.8	25.8
Drawn at 580 degrees Cent.	56.3	54.6	32.2	32.7
Drawn at 455 degrees Cent.	50.0	49.0	27.8	18.0
Drawn at 360 degrees Cent.	39.1	40.2	9.2	12.8
Quenched at 825 degrees Cent.	....	20.5	....	6.5

*Broke in threads because of annealing ends for threading.

From a paper to be presented at a meeting of the American Institute of Mining Engineers, February, 1918.

were removed from the furnace and dropped into buckets of cold water.

The bars under section 5 were heated to 765 degrees Cent., the switch was pulled, and the final temperature attained was 865 degrees Cent. They were removed and quenched in water. Then they were replaced and drawn at 360 degrees Cent., again removed and quenched in water. The bars under section 6 were heated to 765 degrees Cent., the switch was pulled, and the final temperature attained was 860 degrees Cent. They were removed and quenched in water; then replaced and drawn at 455 degrees Cent., and finally removed and quenched in water. The bars under section 7 were heated to 800 degrees Cent., by mistake, the switch pulled, and the final temperature attained was 900 degrees Cent. They were removed, quenched, and then drawn at 580 degrees Cent., and quenched in water.

Preparation of Test Specimens

After heat treatment there were 42 bars ¾ inch in diameter, and 7½ inches long. Thirty-six of these were sawed up into three pieces, 4 inches, 2½ inches and 1 inch long. The six bars under section 4 (quenched at 845 degrees Cent.) were found to be too hard to saw, and in order to cut them up a thin alundum wheel had to be used. As the wheel was in poor condition, the process took about 4 hours per bar, so only one high and one low-copper specimen from this section were cut for tests.

The 1-inch lengths were set aside to be polished on the ends for microscopic work, scleroscope tests, and Brinell hardness numbers.

The 4-inch lengths were turned into standard test specimens 0.505-inch diameter and 2-inch gage length with threaded ends. The bars to be tested as quenched were too hard to turn on a lathe. A 7-inch length was therefore used and the ends annealed in a blacksmith's forge to allow the cutting of the threads. During the heating, the center was kept cool with water. A 2-inch gage length was then ground at the center of the bar. The 2½-inch lengths were ground down into small rectangular bars 0.395 inch square, and 2 inches long, with a slot cut half way through in the middle of the bar. The slot cutter gave a slot 1 millimeter wide.

Each specimen was broken in an Olsen testing machine and readings were taken of its yield point, ultimate strength, reduced diameter and elongation in 2 inches. The yield point was determined by watching for the drop of the beam and in a few cases by measuring with calipers the change in elongation under equal increases of load.

The average values computed from the observations are ginen in Table II. The shock tests were made on the Charpy machine at the Watertown arsenal. The results of this test, the Brinell and scleroscope tests are tabulated in Table I.

The one fact revealed by the microscopic study was that for the same treatment the high-copper steel was finer grained than the low-copper. The quenched and drawn specimens of high-copper steel were also slightly more martensitic. The results need little interpretation. The table of tensile strengths shows a striking superiority of the high-copper steel. The yield point and ultimate strength are in every case higher while the ductility is practically the same, although here too the average figures for reduction of area are with one exception slightly higher for the high-copper than for the low. This, however, is offset by slightly higher values for elongation in a majority of the tests in favor of the low-copper.

Previous Tests Confirmed

The hardness tests by both methods show the high-copper steel in all tests to be harder than the low-copper. The Charpy shock tests show the high-copper steel in all cases to be superior to the low-copper. In general, the results confirm the work of Ball, Stead, Breuil, and Campbell as regards the effect of copper on hardness and tensile strength. They confirm the work of Breuil as regards brittleness and the work of Campbell as regards reduction of area. It is also true, that as Stead has stated, the behavior of the copper steel resembled that of nickel steel.

Standardization and the Metric System

IN A PAPER read at the annual meeting of the American Metric association held in Pittsburgh, Dec. 29, Herbert T. Wade outlined the progress made toward policies of general standardization in articles, machines and materials for general use. The war is forcing standardization, and the coming of peace will find an increased uniformity of standards, which started with munitions and has broadened to other manufactured articles.

Standards should be fundamental, invariable, logically developed, readily understood, and universally accepted. Accordingly it is necessary to consider all policies of standardization with regard to fundamental units and the systems which underlie these fundamental units. For the reason that a system of standardization depends upon exact determinations and precise measurements, it is proposed that the metric units are best fitted for use. The use of the metric system of weights and measures in scientific work throughout the world warrants this assumption. The metric system is said to be best fitted for standardization work for a number of other reasons. It is the simplest system, starting with fundamental units of length and mass. It is represented by appropriate standards of the highest scientific integrity and invariability. It is complete, in that all forms of measurement may be developed without comparison with arbitrary units or standards. It is equally adaptable to the purposes of the scientist in measuring diminutive wave lengths and to the uses of the engineer in specifying a girder span.

Weights and measures have furnished a barrier between countries which partly can be overcome by cumbersome processes of conversions or equivalents for the reduction of one system to the other. But styles, sizes and qualities must conform to the wishes of the consumer who will purchase where his requirements are met. Each country may have its own systems of measurement and may develop standards to its needs based on these measurements. International weights and measures, however, must be the point of departure for any system of international standards, and it is suggested that the speediest realization of international standards may be accomplished through the adoption and use of the metric system.

The harmony secured through international standardization is evidenced in the case of electrical units and standards which have been maintained for years by international agreement. In this case standardization has gone much further than units and definitions, for an international commission regulates international standardization while committees are seeking to secure the fullest measures of harmony even to details of standards and practice far removed from fundamentals.

Those who advocate and urge the early adoption of the metric system in English-speaking countries are firmly convinced that in no way can this movement of international standardization be further advanced than

by the establishment and use of the metric units. They claim that there will result no mechanical chaos nor commercial confusion. Such claims are made upon the premise that metrological reforms, like industrial and mechanical progress are distinctly evolutionary rather than revolutionary. It is no more possible to abolish the employment of arbitrary weights and measures, or the use of unstandardized articles, by legislative act than it is to eliminate inefficient machinery by such a process. But the way can be pointed toward an ideal system, its introduction may be facilitated by wise statutes, and its general use established in such a manner as to convince all of the inevitable advantages that will result. The metric system is not urged in connection with the movement for international standards with the idea of immediately displacing standards that have demonstrated their usefulness. Those standards may be defined and expressed in metric measurements, but when new standards are established the metric system alone should be used.

Hints for Molding Machine Operators

IN AN unusually complete and interesting catalog describing its full full line of molding machines, the International Molding Machine Co., Chicago, offers the following suggestions which will be of interest and value to foundrymen and others concerned with the production of castings of any sort:

"Do not attempt, if machines of the turn-over principle are required, to use hand-operated equipment on jobs which should be turned over by air; men do not work with maximum efficiency when they are continually laboring under excess strain. Adversely—do not use a power machine if the job to be molded can be turned over with facility and speed on a hand machine; you will slow up a small job if you apply a power machine to it.

"Do not use a machine on which the ramming is done by hand if the work is adapted for jar ramming; while ramming by hand is a very simple operation, on medium and large work it consumes a great deal of time. Adversely, do not use a jar-ramming machine if there is no appreciable saving in ramming time or if the density of the mold is not improved. Very shallow flasks as a rule cannot be jolt-rammed to advantage, and patterns that have a number of loose pieces and flasks in which chills of certain design are used quite frequently require hand ramming.

"Do not select a plain jolt-rammer or a plain turn-over draw machine if a combination design possessing ramming, turning over and drawing features would be a more advantageous equipment. The manner in which combination machines are built permits of each feature of their operation being used independently, so that it may be said there are three complete machines in one, and while the initial cost is somewhat greater, the combination machine when applied to work on which the complete operation of making the mold should be performed by air, is the best investment.

"On squeezer work, while hand-operated machines sometimes give excellent results and the initial cost is very low, power machines, if air is available, should be installed, not only because of the larger outputs that can be obtained, but also because by their use the strength of the operator is conserved.

"The introduction of molding machines, in order that every possible benefit may be derived from their installation, should be followed by consistent action in other directions. If power machines are to be used, it should be seen that there is sufficient compressor capacity to operate them properly. If the work is large, the crane should be of such a design that the molds can be carried off quickly without hampering the movements of the machine operators. Patterns should be properly mounted and kept in good repair. While it is not necessary on any modern machines to use either special patterns or flasks, it is obviously desirable that these items of equipment should receive at least the same attention that would be given them for hand molding.

Patterns Should be Repaired

"Each pattern, before being run regularly on a machine, should be carefully tested for back draft. Damaged patterns should be repaired before they are taken into the foundry. Imperfect patterns mean either the waste of considerable time in patching the molds or losses from bad castings. It will generally be found that in foundries in which molding costs are low and losses very small, there is an efficient man in charge of the pattern shop—one who knows the difference between the right and the wrong way to make a pattern and who takes care that every job, before it is turned over to the machine operator in the morning, is in proper condition and perfectly clean. This man will sometimes have an assistant whose work it is to see that all the machines are thoroughly oiled and the spring, flask rest and clamping rod adjustments properly made so that the full time of the machine man can be devoted to the work of making molds. Foundry equipment is by the very nature of the purpose for which it is used subject to certain inevitably unfavorable conditions, and it is most desirable, if machines are to give continuously satisfactory service, that all bearing surfaces should be kept well lubricated and that the machines should not be subject to such mistreatment as will cause rust and corrosion."

The catalog from which the foregoing suggestions are abstracted, consists of one hundred and ten 7½ x 10-inch pages. It is profusely illustrated and complete descriptions of the full line of plain and combination molding machines built by the International Molding Machine Co. are presented. The catalog also contains a large number of illustrations of machines in actual operation in foundries throughout the country.

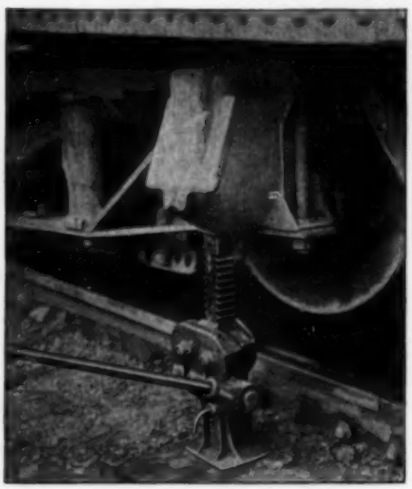
Japan's Steel Output

Japan's steel producing capacity at the end of August, 1917, was 888,000 tons, according to the Japan Advertiser, quoted by Consul General Scidmore of Yokohama, in a recent report. He states this is learned through recent investigations made by the mining bureau. During the first half of 1917, 289,000 tons were produced in Japan exclusive of colonies. The largest producer was the Government Steel Works with 200,000 tons. The Japan Steel Tube Co. came next with 22,000 tons and the Japan Steel Works turned out 14,000 tons, while the two smallest producers, namely the Kawasaki Dockyard Co., and the Kamaishi Steel Works, made 12,000 and 10,000 tons respectively. It is estimated that the year's production of those mills will reach at least 570,000 an increase of 50 per cent over 1916. If that ratio of increase is maintained by the end of 1918 production will equal if not exceed capacity.

Worm Drive Applied to Jacks

Double screw thrust and the principle of gear reduction to increase power are both used in the jack handled by the United States Jack Co., of which Chas. G. Sankey, Cleveland, is president. Two opposed worm gears placed on a horizontal shaft engage the larger of two concentric gears. The smaller gears in turn engage racks on each side of the lifting pedestal of the jack. The resulting thrust of the worm gears being opposed and on the same shaft is transmitted in lifting effort. The opposed worm gears in turning exert no end thrust on the shaft, but transmit the effort through the reduction gears to the lifting racks.

The jacks are being manufactured in one and two-ton sizes for use in automobile and motor truck work. Larger sizes up to 20 tons are furnished for all classes of heavy work. One of the larger jacks, shown in the accompany illustration, is engaged in lifting the wheel of a loaded railway car. The later railway jacks embody some changes in design of the base. The base is cast hollow with comparatively straight outside walls and with inner webs for reinforcement. This is to avoid bending or breaking the toe of the base casting in case the jack is disengaged by running the car forward instead of lowering the jack in the regular manner.



WORM DRIVE JACK FOR HEAVY LIFTING

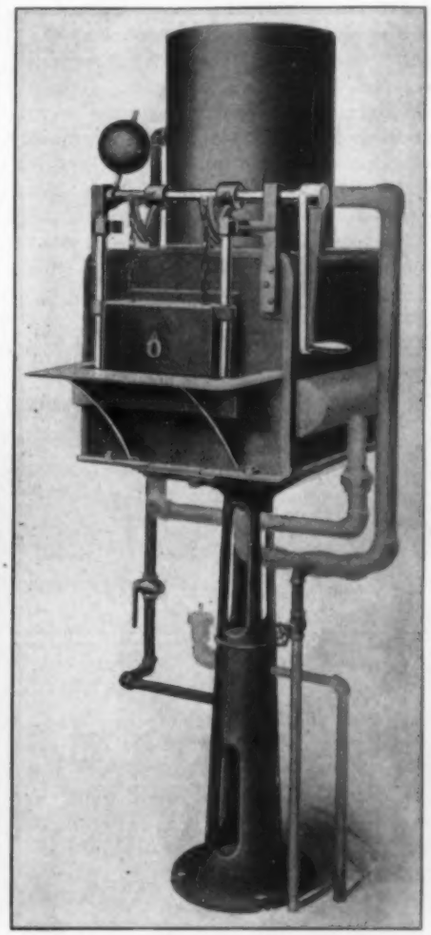
Recuperative Gas Oven Furnace

With the cost of all kinds of fuel used for industrial purposes advancing steadily, heating furnaces are being sought that will give the maximum amount of heat while consuming the minimum amount of fuel. The recuperative furnace shown in the accompanying illustration has recently been placed on the market by Tate-Jones & Co., Pittsburgh. This furnace embodies novel features and it is claimed that it is economical in operation.

The base or pedestal on which the furnace rests is cast iron while the outer case of the furnace is cast iron and boiler plate. The hearth walls are lined with highly refractory material. The burners are designed on the so-called blast system in which the gas and air are mixed at some little distance from the point of combustion. The burners, which are connected directly to a manifold, deliver the ignited fuel under the hearth. Among other features may be mentioned the fact that the thermocouple lies in a recess in the hearth, also the size of the vent that carries away the burned gases has been given consideration.

With the object of salvaging as far as possible the burned gas that otherwise would escape without performing its full quota of work, a recuperator has been added to this furnace. The advantages of recuperation are many, for aside from saving fuel it is said that a better furnace temperature is maintained, inasmuch as practically all the fuel is completely oxidized before leaving the combustion chamber. The recuperator used on this furnace is simple in construction consisting of a coil of wrought iron pipe, specially treated to eliminate oxidation.

The doors of the furnace are constructed to confine all the heat possible while the height of the furnace is such that a man of average stature can see the hearth clearly without stooping.

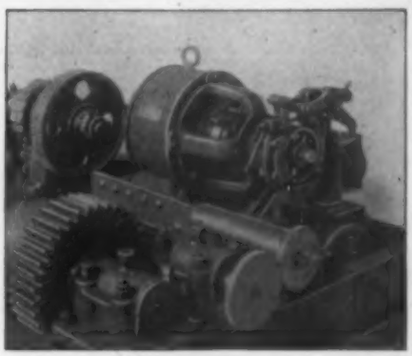


RECUPERATIVE GAS OVEN FURNACE OF NEW TYPE

Magnetic Safety Brakes

The type of magnet which has been incorporated in the design of magnetic controllers by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been employed by the company in a new line of magnetic brakes developed for mill, crane and hoist motors. The modified alternating current brake which has been on the market for some time and the new direct-current brake are similar in operation and have common parts throughout except for the armature lever and magnet.

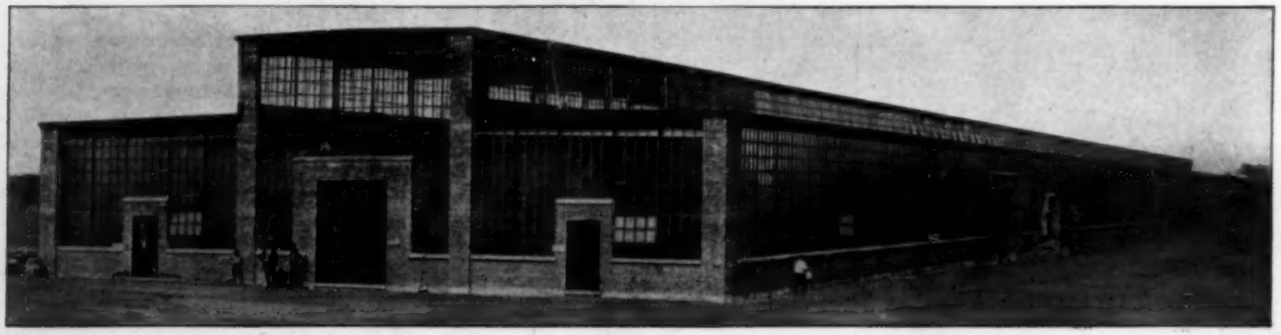
The brakes are designed for quick action in release and setting. When voltage is impressed on the motor, the magnet is energized and the magnet armature lever overcomes the pressure of the compression springs through a toggle and releases the brakeshoe grip upon the brake wheel. While the magnet remains energized, the brake wheel is allowed to rotate freely. As soon as the current is shut off from the motor the brake magnet releases and compression springs force the shoes against the brake wheel, bringing the motor to rest. The amount of force exerted by the brake springs may be adjusted, and a means is provided for taking up the wear on the brake shoes. The accompanying illustration shows the mode of using the brakes.



QUICK ACTION MAGNETIC SAFETY BRAKE

Builds Structure in 49 Days

The accompanying illustration shows the exterior of a new building recently erected for the New York Air Brake Co., Watertown, N. Y., by the Austin Co., Cleveland. The building is 100 x 802 feet and was erected in 49 working days, from June 25 to Aug. 25, five days less than the contract time. All fabricated materials were obtained in Cleveland and were shipped to Watertown in three weeks. The roofing tile is of a gypsum material and was made on the job in 10-foot lengths. This method of roof construction was developed by the Austin Co. to save time. It lessens the number of purlins and truss members and allows the purlins to be loaded to maximum capacity. At the present time four more structures are being erected by the same contractor, having an area four times greater than that of the original building. The longest is 1000 feet in length.



A MODERN BUILDING RECENTLY ERECTED IN 49 DAYS

Manganese and Chromium

The California mining bureau is awake to the needs of munition and other related industries for manganese and chromium. A short bulletin, prepared by F. S. Boalich under direction of Fletcher Hamilton, the state mineralogist, gives the occurrences, some prices and the owners and operators of mines producing these minerals in California.

The characteristic occurrence of manganese in California is in the form of porous black oxide in the coast ranges, though smaller deposits are found in fragments disseminated in auriferous gravels or in deposits associated with igneous rocks in the Sierra Nevadas. Some of the gray carbonate of manganese is also found in California. The market for the greater bulk of manganese ore produced in California is in the steel producing centers of the east, and the freight rate which must be considered in forming a price comparison is $10 a ton to Chicago and $14.86 to the eastern coast.

Like manganese, chromium owes its present important position in the mineral industry to important conditions arising from the war. The major use of chromite is as a refractory lining in steel or copper furnaces, and lesser amounts are used in the manufacture of the chrome-steel alloys. In California, chromium occurs in association with serpentine as the black oxide, chromite and is found in both the coast range and the Sierra Nevadas.

Previous to 1916, California was the only state which mined chromium ore on a commercial scale. Large amounts of low grade chromite were necessarily mined along with the more valuable ores, and until recently this material was piled on the dumps. An effort is now being made to concentrate this low grade ore. One plant for this purpose was tested in October, and another was recently completed. A trial run on 10 per cent ore yielded a 40 per cent concentrate and left 10 per cent of chromic oxide in the tailings. There are between 70 and 80 chromium ore mines in California.

Book Review

United States Rifles and Machine Guns, by Colvin and Viall; published by McGraw-Hill Book Co., Inc.; cloth, 332 pages; 8 x 11½ inches; furnished by THE IRON TRADE REVIEW for $3.00.

A new book on United States rifles and machine guns is particularly valuable at this time. In the preface of the book under review it is stated that the descriptions and methods were compiled in book form at the request of the ordnance bureau of the United States army for the purpose of assisting manufacturers in undertaking large contracts for this arm, should necessity arise.

The authors describe the methods used at the Springfield armory in manufacturing the Springfield 1903 model service rifle. The various steps in the manufacture of the numerous component parts are described at length and every operation is graphically illustrated. Many drawings are shown. Aside from the chapters devoted to the manufacture of the Springfield 1903 model service rifle there are included illustrated chapters on the evolution of the American military rifle, the modified Enfield 1917 model rifle, the United States 1909 model 30-caliber automatic machine rifle, the Lewis machine gun and the 1915 model Vickers machine gun. The book is written in a clear comprehensive style and will prove of value to arms manufacturers and others interested in modern ordnance.

New Japanese Steel Plant

A report received by the United States bureau of foreign and domestic commerce states that the Oriental Steel Mfg. Co., which will undoubtedly be one of the largest steel companies in Japan, will soon complete its organization. The company has been projected to take over the rights obtained by the Sino-Japanese Industrial Development Co. and to work the Taochun iron mine in Anhui. The promoters delayed the organization of the company to make sure of the official bounties under the steel industry encouragement law recently promulgated. The company plans to establish blast furnaces for the production of pig iron at the rate of 170,000 tons a year, steel works with a capacity of 100,000 tons of ingots a year, a rolling mill to produce more than 75,000 tons of various shapes a year, and other workshops which will turn out miscellaneous products.

Two furnaces, with a capacity of 250 tons a day, will be installed together with coke ovens. The company proposes to invest nearly $4,000,000 in this part of its plant. In the steel works three furnaces will be installed with auxiliary equipment at a cost of over $2,000,000. The company's experts for some time past have been investigating the possible location for its works, and Imari, Saga prefecture, has been approved as the site.

Increased Light With Less Glare

Overhead Diffused Lighting Helps to Maintain a Maximum Production—Objectionable Shadows Are Diffused by Large Reflectors—Metal Cap Intercepts Direct Rays—Glossy Porcelain Minimizes Dust Collection

THE problem of obtaining lamps with sufficient intensity to supply ample illumination, and yet free from strong glare, has been studied carefully in shops, factories and all industrial plants. Reflecting caps were first employed. The usual lighting unit consisted of a bowl or dome-shaped enameled reflector, a clear bulb gas filled lamp being used. Later, clear bulb vacuum lamps began to be substituted with an increase in light intensity but, often, with an undesirable increase in glare.

Glare Causes Trouble

These results led to the belief that the intensity produced was of too high an order. It has been pointed out, however, that the entire trouble was due to glare, the latter being the result of having a high power filament crowded into a small space and directly visible to the eye. Outdoor daylight intensities are said to be a thousand times as high as indoor artificial intensities, yet the former ordinarily cause no annoyance because the rays are correctly balanced and properly diffused.

One of the first methods to be adopted for securing the advantage of the higher intensities offered by the new lamp, and at the same time minimizing glare, was that of using bowl frosted lamps. Methods of entirely

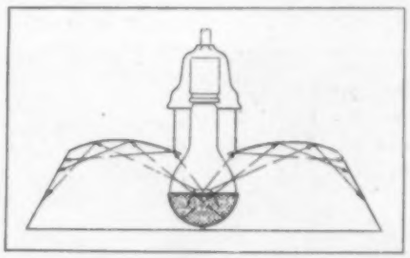


FIG. 1 — CROSS SECTIONAL VIEW OF LAMP WITH SILVERED CAP

avoiding glare have been studied, however, and for that reason, a recently designed unit is of particular interest. It consists of a metal reflecting cap, shown in Fig. 1, which clamps tightly over the bowl of the lamp, and a spceially designed reflector which has high diffusing qualities. By fitting the metal cap closely to the bowl of the illuminant, it is said that all opportunity for dust to reach the polished surface is obviated, while the exclusion of air circulation between the cap and the bulb prevents tarnishing, which would injure the reflecting properties of the metal cap. No direct light rays from the source can reach the eye. Instead, the light is reflected upward to the porcelain-enameled reflector which, in turn, redirects it downward.

Light is Evenly Diffused

A porcelain-enameled dome reflector is used which has a concave upper reflecting service, 20 inches in diameter. This large size is necesary to obtain the desired softness of appearance and shadow diffusion. The light emitted by the lamp filament is intercepted by the metal cap, shot upward to the enameled reflector and diffused evenly. Glossy porcelain is used in the upper reflector to minimize dirt collection and to make cleaning easy. Since the unit itself is of low, even brightness, the reflections on polished surfaces are free from glare.

The new unit has been adapted par-

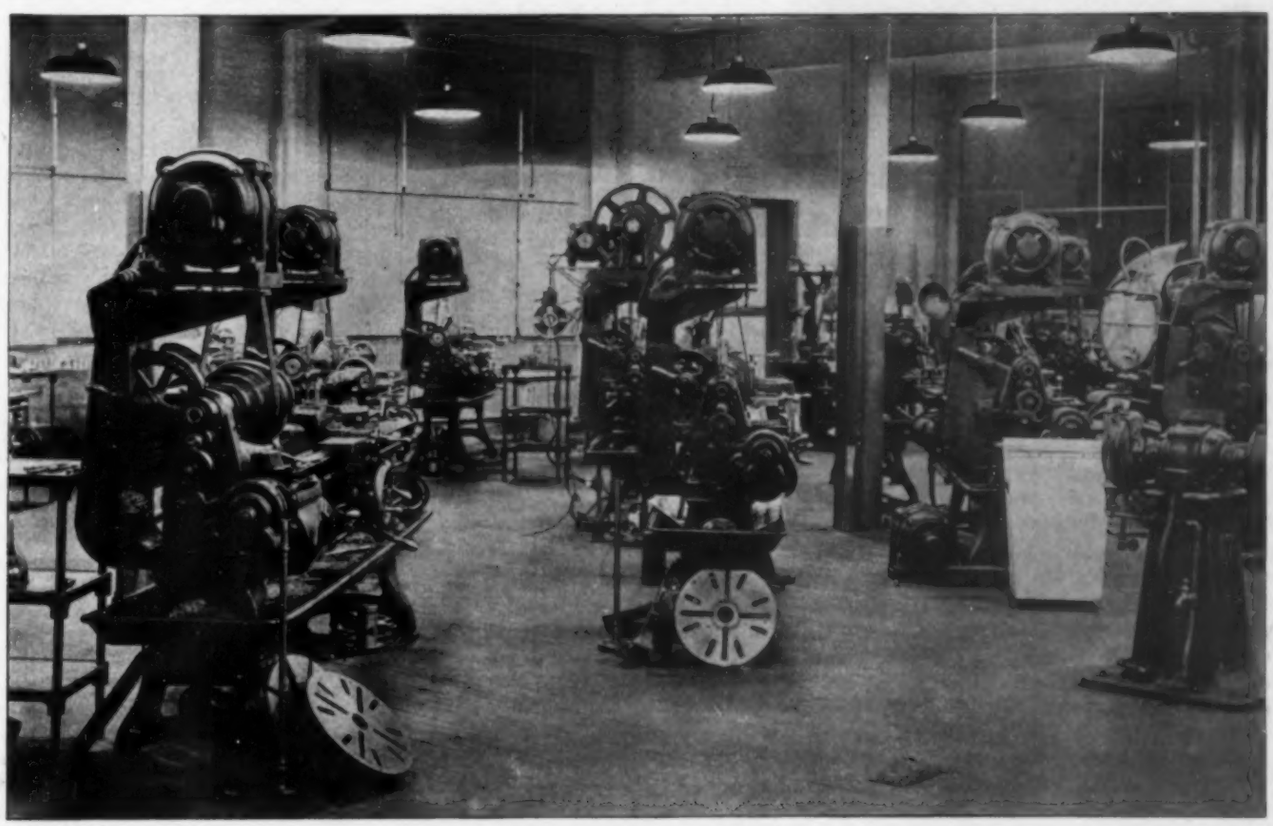


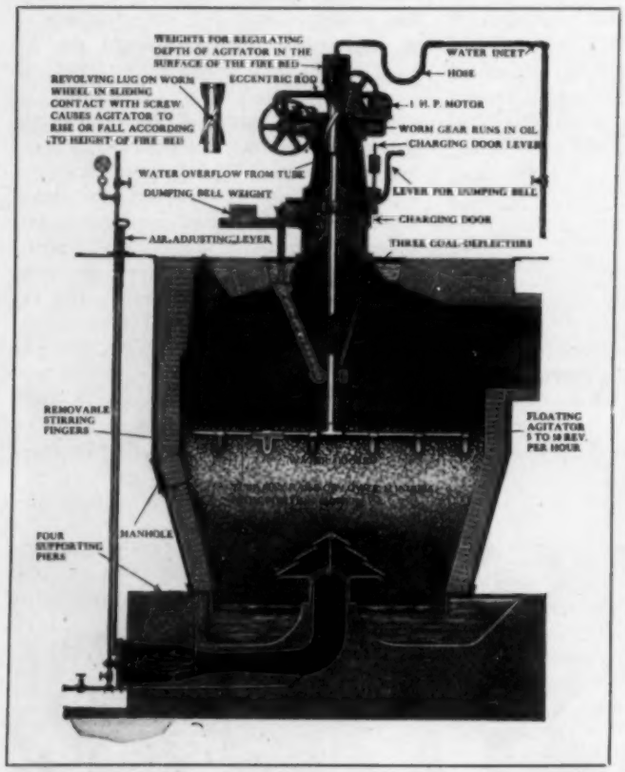
FIG. 2—MACHINE SHOP ILLUMINATED BY NEW TYPE OF LAMPS

ticularly for use in textile mills, machine shops, and factories of all kinds where efficient, diffused illumination is necessary.

An Automatic Agitator

The Chapman Engineering Co., Mt. Vernon, O., has brought out a floating agitator for gas producers which embodies several new principles. The accompanying illustration shows the construction of this device.

The agitator, which is in the form of an inverted tee, is made of extra-heavy seamless tubing. It revolves through the surface of the fire bed of the producer at the rate of five revolutions per hour, or more if desired. The cross arms of the tee are provided with high-carbon steel stirring fingers which extend down into the fire bed. An inner tube carries cooling water to the end of each finger.


WEIGHTS FOR REGULATING DEPTH OF AGITATOR IN THE SURFACE OF THE FIRE BED
REVOLVING LUG ON WORM WHEEL IN SLIDING CONTACT WITH SCREW CAUSES AGITATOR TO RISE OR FALL ACCORDING TO HEIGHT OF FIRE BED
ECCENTRIC ROD
WATER OVERFLOW FROM TUBE
DUMPING BELL WEIGHT
AIR-ADJUSTING LEVER
WATER INLET
HOSE
1 H. P. MOTOR
WORM GEAR RUNS IN OIL
CHARGING DOOR LEVER
LEVER FOR DUMPING BELL
CHARGING DOOR
THREE COAL-DEFLECTORS
REMOVABLE STIRRING FINGERS
FLOATING AGITATOR 5 TO 10 REV. PER HOUR
FOUR SUPPORTING PIERS
MANHOLE

A FLOATING AGITATOR FOR STIRRING THE FIRE BED OF A GAS PRODUCER

The important feature of the agitator is that it automatically accommodates itself to the varying heights of the fire bed. The device is raised and lowered by a driving head provided with two large screw-like spiral flanges. These flanges engage in sliding contact with two lugs projecting inwardly from the hub of the driving wheel. Normally the driving wheel and driving head revolve together, but should the agitator strike an obstruction, or become submerged deeply in the fire bed, it automatically screws up to a point where the forces are again in balance.

If an excessively high fire bed causes the agitator to float up to its limit, 2 feet, it automatically releases and relieves any strain on the machinery. The entire mechanism is driven by a 1-horsepower enclosed motor.

The agitator is not designed to break up clinkers after their formation, but to prevent their accumulation and fusion through the destruction of blow holes and hot spots by thorough stirring. It is claimed by the manufacturer that the frequent stirring of the fire bed increases the capacity of the producer and improves the uniformity of the gas. Practically all hard poking is said to be eliminated. The agitators are made in two different forms; one as a part of a complete producer and the other for separate installation on handpoked producers already in use. The agitator is built with or without an automatic coal feeder as required by local plant conditions. A test made with an agitator used on a gas producer in a large steel mill showed a rate of 1600 pounds per hour with the following analysis: Carbon dioxide, 5.0; oxygen, 0.4; carbon monoxide, 24.6; methane, 3.5; hydrogen, 11.5; nitrogen, 54.2; and 151 B.t.u. per cubic foot.

Copper Production for 1917

The production of copper in 1917 was slightly less than in 1916, according to preliminary figures and estimates collected by B. S. Butler, of the U. S. geological survey, department of the interior, from all plants that make blister copper from domestic ores or that produce refined copper. At an average price of about 27 cents a pound the output for 1917 has a value of $510,000,000, as against values of $475,000,000 for 1916 and $190,000,000 for 1913.

The figures showing the smelter production from domestic ores represent the actual output of most of the companies for 11 months and the estimated output for December. A few companies gave no figures for November, but furnished estimates of the combined outputs of November and December. The production of blister and lake copper from domestic ores was 1,890,000,000 pounds in 1917, against 1,928,000,000 pounds in 1916 and 1,224,000,000 pounds in 1913.

The output of refined copper (electrolytic, lake, casting and pig) from primary sources, domestic and foreign, for 1917, is estimated at 2,362,000,000 pounds, compared with 2,259,000,000 pounds for 1916 and 1,615,000,000 pounds for 1913.

War Affects South Africa

In Johannesburg and surrounding territory in South Africa, iron and steel are used principally in the mining industry and construction work, according to John B. Bray, United States consul in that district. Mining is the pre-eminent industry of South Africa, and since all other branches are related to it, a large demand for all kinds of iron and steel goods is created. Acute shortages exist since stocks which were large prior to the war have dwindled and great difficulty attends replenishment. Four things have resulted: First, increased cost of production which has raised the prices; second, substitutions in certain lines have been made, such as tiles for corrugated iron roofing; imports have increased (iron and steel imports from the United Kingdom and the United States in 1916 amounted to $4,242,148 and $1,252,618, respectively, as against $3,253,659 and $992,001 in 1915); and fourth, several small iron and steel plants nonexistent two years ago are working at full speed. Every effort is being made at the largest steel plant in the Transvaal at Vereeniging to convert old material into new, for which even at the higher prices there is a great demand. This has been brought about by the recent impetus given to house construction, the people believing it useless to wait for lower-priced material.

The Seattle Smelting Co., Seattle, through Henry G. Runkle, secretary, advises that one 5-ton electric furnace has been installed for the manufacture of ferromanganese and that the company plans to install other units later for the production of ferrosilicon and ferrochrome.

Determining the Proportional Limit

One-Man and a Two-Man Machine for Obtaining Semi-Autographic Tension Tests and Stress-Strain Diagrams Within the Proportional Limit Are Described in Detail

BY H. F. MOORE

ATTENTION of materials testing engineers has been called to the desirability of an appartaus for making rapid, yet accurate, determinations of the proportional limit of materials. Various ingenious autographic testing rigs have have been proposed, but in many cases such rigs have not been capable of great speed in use, and have been delicate and easily thrown out of adjustment. During the past year the writer has built and used an autographic testing rig in the materials testing laboratory of the University of Illinois, and a description of the apparatus and records of its performance are submitted in this paper.

It should be stated that the principle involved is by no means new. An autographic apparatus involving the principle used has been described by one experimenter and a method of locating the proportional limit which is somewhat like the method followed by the author was explained in detail by another investigator. The writer remembers a similar device used in 1896 on a torsion testing machine in the laboratories of the New Hampshire state college.

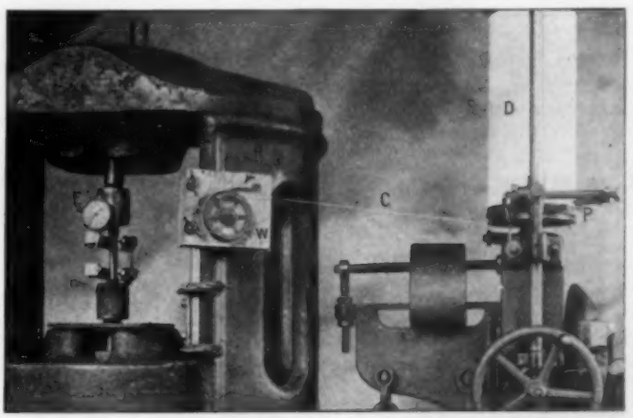


FIG. 1—SEMI-AUTOGRAPHIC TESTING APPARATUS FOR DETERMINING PROPORTIONAL LIMIT

As applied to tension testing, the apparatus is shown in Fig. 1. Attached to the driving gear of the poise of a testing machine is a screw which moves the pencil *P* vertically through a distance proportional to the travel of the poise. The pencil point draws a record on a paper wrapped around the drum *D*, and the drum is rotated by means of a cord *C* which is attached to a sheave mounted on the same axle with the toothed wheel *W* which is fitted with a ratchet *R*. If the test is to be made without stopping the testing machine, two men are required to conduct the test. One man operates the poise of the weighing beam, keeping the beam balanced as the test proceeds and the other man watches the dial of an extensometer *E* which is attached to the specimen. This extensometer may be of any type which is self-indicating, that is, one in which no handling of the instrument is necessary in order to obtain a reading. As the pointer of the extensometer moves past each successive division mark of the dial the operator watching the extensometer moves the toothed wheel *W* one tooth, turning the recording drum a short distance. This procedure is kept up until the yield point is reached, or until there is danger of rupture; the extensometer is then removed and the man at the beam

A paper presented by H. F. Moore, at the twentieth annual meeting of the American Society for Testing Materials held at Atlantic City, N. J., June 26-29, 1917. The author is professor of engineering materials, University of Illinois, Urbana, Ill.

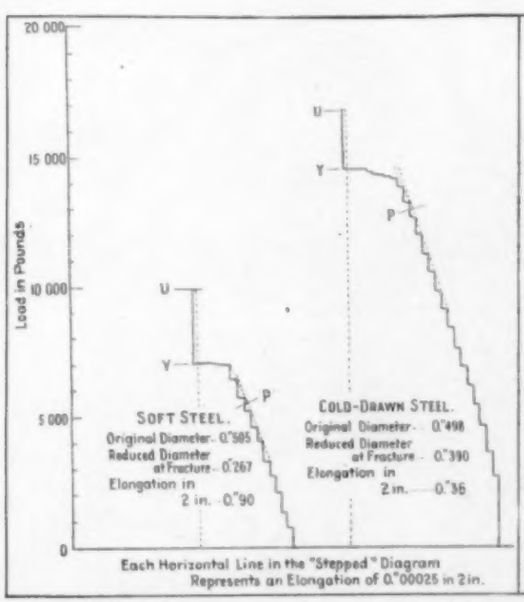


FIG. 2—TYPICAL TEST RECORD MADE FROM APPARATUS SHOWN IN FIG. 1

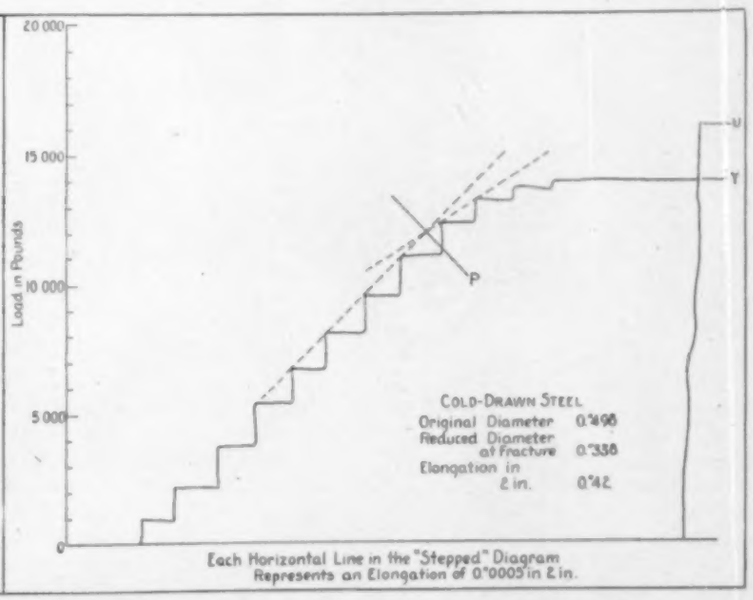


FIG. 3—RECORD MADE ON MACHINE SHOWN IN FIG. 4

keeps the beam in balance until the ultimate strength is reached. The testing machine is not stopped during the test and is usually speeded up after the yield point is reached.

A typical test record is shown in Fig. 2. This record consists of a number of steps decreasing in height as the proportional limit is passed. A curve connecting the edges of the steps gives the stress-strain diagram up to the yield point. In Fig. 2, solid lines are those actually recorded, and broken lines are construction lines used to locate the proportional limit, *P*. The yield point is located at *Y* either by the "drop" of the beam or the sudden increase in extensometer readings, the man at the extensometer stopped turing the drum as soon as the yield point was reached, and the ultimate strength, at *U*, is given by the extreme height of the diagram.

In Fig. 2 the width of each step on the diagram corresponds to an elongation of 0.00025-inch in the gage length of 2 inches. A deviation of 0.0001-inch from Hooke's law could readily be detected in Fig. 2.

The apparatus just described requires the services of two men during a test. An apparatus which can be handled by one man, and which, though slightly less accurate than the apparatus shown in Fig. 1, gives good results and is shown in Fig. 4. The spring of a steam-engine indicator is used to keep the beam of the testing machine in balance, the poise remaining stationary during the test. Bearing on the beam is one end of a pointed rod, the upper end of which bears against the piston of a steam-engine indicator, whence the pressure is transmitted to the indicator spring. The pressure against the indicator spring, and consequently the vertical motion of the indicator pencil *P*, is proportional to the load applied to the specimen. The rotation of the indicator drum *D* is controlled by a cord *C* attached to a toothed wheel *W*, the arrangement being similar in every respect to the device for rotating the drum shown in Fig. 1. In using the apparatus shown in Fig. 4 the operator watches the dial of the extensometer *E*, and as the pointer passes each successive division on the dial he turns the toothed wheel one notch. Fig. 3 shows a typical diagram obtained with this apparatus; the solid lines show the diagram actually obtained, and broken lines are construction lines used in locating the proportional limit *P*. The yield point is located at *Y*, and the ultimate strength at *U*. The testing machine is kept running continuously during the test. In Fig. 3, the width of each step on the diagram corresponds to an elongation of 0.0005-inch in 2 inches.

The speed of operation attained by the writer and an assistant using the rig shown in Fig. 1 on a test of six 2-inch threaded-end specimens of iron and steel was as follows:

	Time per specimen.
Measuring, marking, testing, measuring elongation and reduced diameter	3 min. 10 sec.
Locating, on diagram, proportional limit, yield point, and ultimate strength, computing stresses and filling in report blank	1 min. 22 sec.
	4 min. 32 sec.

The speed of the head of the testing machine was 0.1-inch per minute up to the yield point and 3 inches per minute beyond the yield point. Using the apparatus shown in Fig. 4 for a test of ten 2-inch shouldered specimens of steel, the speed of the testing machine was 0.05-inch per minute up to the yield point, and 1.63 inches per minute beyond the yield point. The speed of operation for this test was as follows:

	Time per specimen.
Measuring and marking	0 min 41 sec.
Testing, measuring elongation and reduced diameter	3 min. 51 sec.
Locating, on diagram, proportional limit, yield point, ultimate strength, computing stresses and filling in report blank	1 min. 52 sec.
	6 min. 24 sec.

Both of the arrangements of apparatus described are rugged and simple. The extensometer used can be of any desired degree of sensitiveness, and the delicate parts of the instrument are not touched during the test. The proportional limit is determined from a diagram covering a series of readings, not from a single reading, and the smoothness of the curve outlined by the corners of the steps of the diagram gives an indication of the care and accuracy with which the test was made.

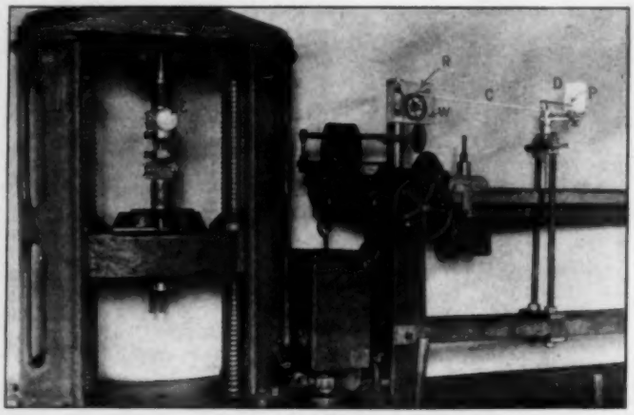


FIG. 4—ONE-MAN APPARATUS FOR DETERMINING PROPORTIONAL LIMIT

Producing Tool Steel

Greater production and conservation of tool steel resulting from the government's urgent demands upon manufacturers are visualized in a series of motion picture films prepared by the Atlas Crucible Steel Co., Dunkirk, N. Y. These films were presented at a meeting of the Cleveland Engineering society on Jan. 8, and F. B. Lounesburry, metallurgist for the Atlas company explained in detail the manufacture of high speed and other alloy steels. A comparison was drawn between the electric furnace and crucible processes of steel manufacture. The speaker expressed a preference for the electric furnace where its use is possible, but stated that tungsten steel is more satisfactory when made in crucibles. This was explained by the theory that the tungsten elements, being heavier, sink to the bottom of the molten mass in an electric furnace and segregation results. The same conditions may obtain in crucibles, but the mixing of the smaller portions in the ladle is said to break up the segregation. Mr. Lounesburry attributed the higher cost of crucible steel to the fact that more hand labor is required in the crucible than in the electric furnace process, and skilled labor is both scarce and expensive.

Fuel Shortage Abroad

That the fuel shortage is not peculiar to America is shown by the report that Denmark may be forced to import electric power from Sweden, where waterpower is harnessed. Commercial Attache C. W. A. Veditz at Paris likewise reports that the administrative council of the Swiss Federal railways has decided to install electric traction in the near future upon the branch railway lines between Scherzlingen and Berne and between Brigue and Sion. A credit of 9,700,000 francs has been voted. This electrification of railways has been postponed from time to time owing to the high initial cost, but the increasing scarcity of coal, which threatens to become a real calamity for Switzerland has made the change not only practical but necessary.

Foundrymen Elect

At the annual meeting of the New England Foundrymen's association, the twenty-second anniversary of the founding of the association was celebrated and officers elected for the ensuing year. The new officers are as follows: President, George P. Aborn, Blake & Knowles Steam Pump Works, East Cambridge, Mass.; vice president, H. Paul Buckingham, Arcade Malleable Iron Co., Worcester, Mass.; treasurer, George H. Gibby, Gibby Foundry Co., East Boston, Mass.; secretary, Fred F. Stockwell, Barbour-Stockwell Co., Cambridge, Mass. Executive committee, Charles A. Reed, Reed, Fears & Miller, Boston; Robert E. Newcomb, Deane Steam Pump Works, Holyoke, Mass.; A. N. Abbe, American Hardware Corp., New Britain, Conn.; A. B. Root, Hunt-Spiller Mfg. Corp., Boston; and W. J. Lavelle, New England Gas & Coke Co., Boston. The election of the officers was followed by a dinner and entertainment, with the new president, Mr. Aborn, presiding. More than 200 members and friends attended.

Large shipments of shapers and other toolroom equipment are being made to government arsenals and other plants by the Milwaukee Shaper & Transmission Appliance Co., Milwaukee. The entire output of the plant for 1918 has been sold.

Western Manganese Deposits Extensive

THE U. S. geological survey is directing every effort toward the discovery, prospecting and estimating of manganese deposits which war conditions have made vital. The shortage of manganese has stimulated production in the western part of the United States, and both high grade ores and those suitable for making spiegeleisen are produced in increasing quantities. In 1914 only 2635 tons of ore containing 40 per cent or more of manganese was shipped by 10 domestic operators, whereas in 1917 the output of similar ore indicated by reports on the first nine months of the year, will probably be over 122,000 tons by 90 to 100 operators.

The domestic production of low-grade ore suitable for making spiegeleisen is likewise rapidly increasing. Probably the output of 15 to 40 per cent manganese ore in 1917 will be nearly 500,000 tons and that of 5 to 15 per cent ore will be over 500,000 tons. The total production of manganiferous ores carrying less than 40 per cent manganese was less than 500,000 tons in 1914.

The geological survey has been active in making examinations of deposits of manganese and maganiferous iron during the season of 1917 with a view to appraising the domestic resources. A report which describes briefly the deposits in parts of Colorado, Montana, Nevada, New Mexico, Texas, and Arizona has just been issued.

High Grade Ore in Montana

In the vicinity of Philipsburg, Mont., quantities of high grade ore are now being produced. The deposits are irregularly scattered but are all within a short wagon haul of the Northern Pacific railway. The deposits all seem to contain about the same percentage of manganese, and only a small proportion is exceptionally siliceous. In preparing the ores for shipment the waste is picked out by hand and the entire product is passed over screens to reduce the percentage of silica. The screenings from one of the larger mines contain 32 to 40 per cent manganese and 20 to 28 per cent silica, whereas the average content of the lump ore is 40.5 per cent manganese and 15 per cent silica. Most of the ore shipped from the district contains about 45 per cent manganese, less than 2½ per cent iron, and about 15 per cent silica, with low phosphorus. Material of this grade is worth about $30 a ton, f. o. b. Philipsburg.

Large Yields Predicted

Some of the larger ore bodies will probably yield from 10,000 to 40,000 tons each, and a few of them may yield more than 40,000 tons. It is also likely that a number of the small prospects will add considerable to the total production of the district. As the present development is meager, however, it is estimated by the survey that the Philipsburg deposits contain at least 135,000 tons of ore suitable for making ferromanganese, and perhaps as much as 350,000 or 400,000 tons.

Deposits of manganese ores have been found at Shumla, Texas, on the main line of the Southern Pacific railroad. Ore from various deposits analyzes from 12 to 45 per cent manganese, 3 to 4 per cent iron, and 10 to 15 per cent silica. The ore replacement is low in specific gravity, and consists principally of the mixture of oxides known as wad.

The historic mining district of Leadville, Colo., again is coming into prominence through the production of manganiferous ores. About 500 tons of manganiferous iron ore is now being shipped every day from the Leadville district. The ore, which averages 20 to 25 per cent manganese, 24 to 30 per cent iron, and 10 to 15 per cent silica, is reduced to 33 per cent spiegeleisen and is now being used with excellent results in both the bessemer and open-hearth processes. Hand sorting is a considerable item in the cost of mining, as siliceous nodules are common and seams of clay traverse most of the ore bodies. In places ground is being reworked for the third or fourth time, and old timbers, waste dumped into abandoned stopes, and large areas of caved ground must be contended with. On the other hand, at every mine except one it is possible to dump the ore directly into the railroad cars. The large number of shafts available also serves to lower costs by reducing underground haulage to a minimum. The operators estimate that the present rate of production might be doubled and maintained for at least two years. This estimate would call for about 750,000 tons of ore of shipping grade. It is reported that the present price of ore does not encourage extensive development.

Red Cliff, Colo., on the main line of the Denver and Rio Grande railroad also has manganiferous iron ore deposits. The survey estimates that Red Cliff is capable of yielding 750,000 tons of ore containing 12 to 15 per cent manganese, 38 per cent iron, and 1 to 2 per cent silica.

Estimate of Manganese Ore and Manganiferous Iron Ore in Certain Western Mining Districts

District	Tons, probable	Tons, possible	No. of deposits in estimate	Approximate composition — Manganese	Iron	Silica
Philipsburg, Mont.	135,000	350,000	16	37–46	1.5–6	18
Shumla, Tex.	10,000?	100,000?	2	15–40	2–5	3–16
Leadville, Colo.	700,000	1,500,000	13	20–25	24–30	10–15
Silver City, N. Mex.	500,000	1,000,000	2	16	35	6
Red Cliff, Colo.	750,000	1,000,000	2	14	38	1–2
Pioche, Nev.	550,000	1,000,000	2	12	34	13

In only a few of the ores from these districts does the phosphorus exceed 0.1 per cent and many analyses show a content as low as 0.002.

Dealers Inquiries

Coming Out in Refractories—Pennsylvania Plants Not Closed

Dealers are making inquiries for refractories but producers are sold up and are not in a position to take care of additional requirements. Operations are being maintained at good capacity considering the transportation and fuel situation. Embargoes are hampering shipments, however, and hence cause difficulty in meeting demands of consumers for deliveries. Better supplies of coal are on hand at present at the plants of producers of refractories than was the case up to recently.

The Garfield shutdown order was interpreted in Illinois, Missouri and New Jersey as applying to plants making refractories and they were closed in those states during the five-day period covering the first effective dates of the order and on Monday of the present week. In Pennsylvania, the state fuel administrator held that the order did not apply to plants making refractories and in consequence they continued operations. Kilns of all plants were kept in operation because this is a continuous process that could not be suspended without doing injury to the products.

Refractories

(Per 1000 f. o. b. works)

FIRE CLAY BRICK.

(First Quality)

Pennsylvania	$45.00 to 55.00
Missouri-Illinois	55.00 to 65.00
Ohio	45.00 to 50.00
Kentucky	45.00 to 55.00
New England	55.00 to 65.00

FIRE CLAY BRICK

(Second Quality)

Pennsylvania	$40.00 to 50.00
Ohio	35.00
New England	48.00 to 58.00

SILICA BRICK.

Pennsylvania	$50.00 to 60.00
Chicago	55.50 to 65.50
Birmingham	45.00 to 55.00

MAGNESIA BRICK

(Per Net Ton)

9 x 4½ x 2½ ..... $135.00 to 160.00

CHROME BRICK

(Per Net Ton)

9 x 4½ x 2½ ..... $135.00 to 140.00

BAUXITE BRICK

(Per Net Ton)

55 per cent	$40.00 base
76 per cent	100.00 base

Plan Rolling Mill

Within the next four months, it is contemplated that a new rolling mill, with an initial daily capacity of 60 tons, to be built by the United Steel Co., Everett, Wash., recently organized in Seattle, will be in operation. Those interested include the following: J. Johnson, New Westminster, B. C., who for 25 years has been identified with iron and steel plants in British Columbia; W. E. Stillinger, Seattle, and A. Michelson, Bayside Iron Works; A. M. Robbins, L. L. Bair and others of Everett, among them being the owners of the Rainier Metal Mfg. Co., operating a steel window and sash plant at Seattle.

Steel Plant

On Pacific Coast May be Sponsored by British Columbia

Toronto, Jan. 26.—William Sloan, minister of mines for British Columbia, announced that Vancouver is likely to become the headquarters of a large electric steel plant and plate mill on the Pacific coast. For several months past the provincial government has been carrying on negotiations with eastern capitalists and electric smelter experts. The negotiations have now reached a point where the government has agreed to join with the Pacific Steel Co., Eburne, B. C., and the Aetna Iron & Steel Co., Port Moody, B. C., in which companies the Tudhope interests, of Orillia, Ont., and R. F. Trumbull, Welland, Ont., are interested parties in inviting an eminent outside metallurgist of international standing to visit Vancouver and make a final report on the proposals of establishing a steel plant in the city.

The department of marine and fisheries, announced that the Canadian government has received tentative offers from large American companies desiring to engage in the manufacture of steel for shipbuilding. These companies, however, require encouragement in the way of bonuses and concessions before taking up the manufacture of steel in Canada on a large scale.

The Canadian government railway department shortly will place orders for $7,000,000 worth of rolling stock. Contracts amounting to $4,000,000 for locomotives, cars, etc., were let a short time ago and deliveries are now being made. Last session the Canadian parliament voted $25,000,000 for additional equipment for Canadian government railways, and contracts are now being placed as rapidly as steel companies can handle them. Although the new rolling stock is primarily for use on the government roads they will be loaned to the Canadian Northern, Grand Trunk and other Canadian roads as occasion requires. The contracts to be placed will be for passenger cars amounting to $3,000,000 and $4,000,000 for box cars, locomotives, machinery, etc.

Sulphate Licenses

Being Granted on Prime Products—By-product Output Reduced

New York, Jan. 26.—Licenses for selling sulphate of ammonia have been granted by Dr. Charles W. Merrill, chief of the division of chemicals, of the food administration, Washington, to all producers, important dealers and brokers and to most of the manufacturers requiring them. Such licenses are required only by companies dealing in the prime products of ammonia. Dealers who sell secondary products of ammonia or the companies which manufacture secondary products, are not included in this class. The complexion of the market in sulphate of ammonia in the near future depends upon government requisitions. Some months ago contracts were closed which took up producers' output to May 1, 1918, and in some cases to the end of the year. Recently the government requisitioned large quantities which necessitated a curtailment in contract deliveries. Output also has been reduced due to the scarcity of fuel. The supply is very tight and undoubtedly will become much more so. A few spot sales have been made around $5 to $5.25 per 100 pounds at seaboard.

Production of all the coal-tar by-products has been restricted by the coal scarcity, so that the tone of prices generally is stronger. Buying is quiet, with the exception of benzol. Some fair-sized contracts were closed and numerous spot lots were sold at prices ranging from 35 to 40 cents per gallon. Some large spot inquiries are pending. None of the producers have any phenol to offer. Brokers are selling occasional spot lots at 53 to 55 cents per pound. Business is rather dull in solvent naphtha.

Coke Oven By-Products

Spot

Per Gallon at Producers Plant

Pure benzol	$0.35 to .40
Toluol (nominal)	1.70 to 1.80
Solvent naphtha	.18 to .22

Per Pound at Producers Plant

Phenol	$0.53 to .55

Per 100 Pounds at Seaboard

Sulhate of ammonia (nominal)	$5.00 to 5.25

Contract

Per Gallon at Producers Plant

Pure benzol	$0.35 to .40
Toluol	nominal
Solvent naphtha	.18 to .22

Per Pound at Producers Plant

Phenol nominal.

Per 100 Pounds at Seaboard

Sulphate of ammonia ..... nominal

Labor To Dominate World

—SCHWAB

Bethlehem Steelmaster Perceives Revolutionary Social Movement Where Position Will Be Measured by Merit and Achievement

PROPHESYING a social renaissance following the present war, Charles M. Schwab, chairman of the Bethlehem Steel Corp., in speaking Jan. 24 at a meeting of the "Old Boys" of Grammar School No. 40, New York City, of which he is an honorary member, predicted that the workman without property, who labors with his hands, is going to be the man who will dominate the world. "We are facing another social situation," he said, "which we should be keenly alive to. Call it socialism, social revolution, Bolschevism, or what you will, it is a leveling process. It is going to be a great hardship to the owners of property, but like all revolutionary movements, it probably will work good. We must not fight this movement but we must educate it. The great effect of socialism will be the destruction of all aristocracies except the one of merit. The coming aristocracy is to be composed of men who have done something for their country and the world at large. The men who have worked for the good of mankind. Don't think I am anxious to give away my wealth and work with my hands. Indeed, there are few of us who like to do what is good for them, but we will find that we must eat the pill, sweet or bitter. Harsh changes are necessary, but they will be more than repaid, not only materially, but in happiness and contentment. Days are in store for the United States of commercial and social supremacy."

Deplores Indiscriminate Criticism

Mr. Schwab dwelt at length on the war situation. He decried recent criticism of officials at Washington. Honest comment will help, he said, but nothing is so injurious as promiscuous and ignorant criticism. Some mistakes, no doubt, have been made, but they are those that would have been made by anyone in similar circumstances. "The trouble with us," Mr. Schwab said, "has been that in many ways we have thought we were supermen in America, who were capable of anything, but now we have got to learn the size of the task before us, and realize that it is no easy job. Be sure, however, that ultimately, this great American people will rise superior to any situation.

"I feel fortunate," Mr. Schwab continued, "to have been born in an age that has witnessed the greatest material growth ever known. This is particularly true of my business, steel and iron, the most valuable natural resources that my country possesses. I feel happy to have under my control those assets which can be used so greatly for the welfare and benefit of my fellow countrymen. My good fortune is not the money which I have, but the fact that I am able to say that my possessions are for the good of my fellow citizens.

Great Destroyer Fleet Coming

"You cannot imagine the magnitude to which the steel works in this country have grown in the last year. The secretary of the navy asked for an enormous number, the exact size of which I cannot disclose, of torpedo boat destroyers, which seem to be the only vessels effective against the submarines. Without going into numbers, I can say that within the next 18 months, the United States will have more of these boats in service than exist at present in all the navies of the world together. In addition to operating all our old plants, we have been compelled to build five new ones, and to employ thousands of new workmen. In regard to ordnance, I can say that we are turning out at present at least 50 per cent more than any company in any unfriendly nation has ever been able to turn out. Our firm figures $750,000,000 will be spent upon marine construction in the near future.

"In addition to upholding the President and his officers, we must contribute our money as we never before have dreamed of. Let us borrow money if we must, and pay the taxes somehow. Above all, let us be optimistic, as hard as it is in strenuous times like these, but remember that the best thoughts come from a happy frame of mind."

Wants Seven Hour Day

As a substitution for the complete shutting down of industry for one day per week, Samuel Gompers, president of the American Federation of Labor, in his recent St. Louis speech, advocated a universal seven-hour day for duration of the war. This is receiving approval by trade bodies in different districts, and is considered labor's reply to Fuel Administrator Garfield.

Foundry Employes in New England on Strike

To obtain the standard of wages and working conditions prevailing on the Pacific coast, approximately 2500 molders, coremakers and patternmakers employed in about 75 foundries in eastern Massachusetts struck recently and union officials claim it is but the beginning of a concerted movement on the Atlantic coast. In spite of the fact that many of the plants affected are engaged on government work, the men demand a maximum increase of a dollar a day. The B. F. Sturtevant Co., Hyde Park, Mass., is the plant principally affected, since it has 365 molders out, who refused to accept its compromise offer of 50 cents. The American Tool & Machine Co. and the Stafford Mfg. Co., in the Boston district, each employing 150, as well as the Becker Milling Machine Co., employing 75 are likewise affected. At East Boston, 150 molders employed by the Gibby Foundry Co. struck Jan. 25, while at that company's Wakefield plant, 75 laid down their tools.

Increases Are Granted

Strikers at the plant of the Coxe Traveling Grate Co., Port Carbon, Pa., have been offered a 20 per cent increase; puddlers employed by the Reading Iron Co., Danville, Pa., have been increased from $11 to $11.60, the highest rate paid in the history of the iron industry in eastern Pennsylvania, while an increase of 25 cents a day, making an increase of $1.25 a day inside of a year, has been granted foundrymen in Worcester, Mass., which was a compromise on the recent demand for a 50-cent increase.

The new wage scale agreed upon at Atlantic City several days ago by the Stove Founders' Defense association and the Stove Molders' union provides for an increase of 15⅝ per cent for piece workers and 75 cents a day, or from $4.25 to $5, for day workers. Fifteen thousand men are affected by the scale, which becomes effective Jan. 1. The settlement—the twenty-eighth between employers and the union without a strike—was reached at a 10-day conference.

An increased force will be set to work by the American Wire Wheel Corp., East Springfield, Mass., to make shells for the government about Feb. 1. Three shifts will be maintained.

Obituaries

SAMUEL A. RICHARDS, who for many years was manager of the Struthers Furnace Co., Struthers, O., but who retired from active business in 1910, died suddenly at the home of his son, Jules G. Richards, in that city, Wednesday evening, Jan. 23. He had spent the day in Cleveland, attending the annual meeting of his company, where he was re-elected a director, and was stricken with heart trouble while conversing with his family. Born in Akron, O., July 9, 1844, he entered the employ of the Girard Iron Co. as a young man and later became a member of the blast furnace firm of William Richards' Sons, at Warren. After several years spent in Cleveland and West Virginia, in 1878 he was made manager of a blast furnace in Braddock, Pa., and later was appointed blast furnace superintendent of the Illinois Steel Co., Joliet. He took charge of a blast furnace at West Duluth, Minn., in 1892, where he remained for a year and then returned to Ohio. He, with W. C. Runyan, purchased the Struthers furnace in 1896, of which he took active management until 1910 when he retired from active business to remain connected as a director.

Peter Hay, who for many years was identified with the steel industry in Galt, Ont., and who founded the Peter Hay Knife Co., there, died recently at the age of 80. He had been for some time retired from active business.

James H. Munroe, founder of the Munroe Wire Works and the Hero Mfg. Co., Winnipeg, Manitoba, died Jan. 21, following a stroke of apoplexy. He had been a resident of that city for 16 years and took a prominent part in civic affairs.

John T. Hanley, born in New York City 71 years ago, died at his home there recently. He was said to be the first man to smelt iron ore on Manhattan Island and before he retired was head of the concern bearing his name for 40 years.

Frederick A. Driver, one of the founders of the Driver-Harris Co., Harrison, N. J., manufacturer of electrical wire, who served as a director for many years, died recently from a stroke of apoplexy at the age of 82. He was born in England, and when still a young man, came to the United States. His son, Frank L. Driver, is president of the company.

Henry Morton Lovering, affiliated with several manufacturing enterprises in Massachusetts, who was president of the Taunton-New Bedford Copper Co., Taunton and New Bedford, Mass., died recently at his home in the former city at the age of 78.

Isaac Rothstein, president of the I. Rothstein Co., Eau Claire, Wis.,

SAMUEL ALLEN RICHARDS

scrap metal dealers since 1878, died at Los Angeles, Cal., recently at the age of 63. He went west recently to benefit his health. He was a native of Russia and was noted as a scholar and linguist.

Robert D. Miller, age 48, who for six years has been chemist in charge of the St. Louis Terminal Railway Laboratory, died at his home in St. Louis recently, after a brief illness. Prior to his affiliation with the terminal railway, he was superintendent of the Carondelet blast furnace at St. Louis.

Winfield Scott Sims, inventor of the Sims dynamite breech gun and many electrical appliances, died at Newark, N. J., Jan. 7, following a complication of diseases. Born in New York 74 years ago, he enlisted to serve in the civil war. He was made president of the New York Ordnance Co.

Frank R. Blaurock, senior member of the firm of Frank R. Blaurock & Son, Chicago, district sales agents for the Andrews Steel Co., Newport, Ky., died recently at his home in Chicago. He was 63 years old and had been connected with the iron and steel business in Milwaukee and Chicago for 40 years.

Edward Everett Roberts, inventor of the Roberts marine watertube boiler and who served as president of the Roberts Boiler Co., Redbank, N. J., died in Brooklyn, N. Y., recently at the age of 76. He was in the United States navy for many years and served in the civil war under Admirals Farragut and Porter.

Eugene St. Clair, who, for many years was associated with his brothers in the operation of the Winthrop mine at Ishpeming, Mich., and subsequently was treasurer and cashier of the Oliver Mining Co., at its section 30 mine in the Cayuna district, died recently at his home in Duluth, Minn., aged 75.

William A. Merriman died recently at New York City, aged 75. For many years he served as vice president of the George A. Fuller Co., and vice president and general manager of the United States Realty & Improvement Co. Many modern steel buildings in Chicago and elsewhere were built by him.

Frank L. Brown, president of the Ransom Concrete Machinery Co., New York, born in Kenosha, Va., March 4, 1860, died recently of heart failure, at his home in New York City. He was manager at one time of the American Steel & Wire Co., San Francisco, Cal., and was one of the directors of the Panama-Pacific exposition.

Aaron B. Hambleton, who was a pioneer in Cleveland shipbuilding, died at the age of 88, Jan. 24, after an illness covering the period of one year. Upon locating in Cleveland, he became a partner in the Globe Iron Works Co., and served as superintendent of the boiler department. When this company was absorbed by the American Shipbuilding Co., he became identified with it and retired from active business in 1910.

Will Dedicate

New Dayton Engineers' Club on Saturday—Club Has 300 Members

The new Engineers' club at Dayton will be dedicated on Saturday afternoon and evening, Feb. 2. It is expected that several hundred representative enginers and business men from Ohio and neighboring states will attend the exercises. The new Engineers' club of Dayton, which is one of the finest structures of its kind in the middle west, was fully described and illustrated in THE IRON TRADE REVIEW, May 17, 1917, page 1089. At the present time the club has a membership of about 300. Col. E. A. Deeds, chief of the aircraft production board, is president. He is devoting his entire time to the war program. The other officers of the club are as follows: First vice president, C. F. Kettering, vice president, the Delco Co., Dayton, O.; second vice president, Orville Wright, consulting engineer, Dayton-Wright Aeroplane Co., Dayton; third vice president, H. M. Waite, city manager, Dayton; recording secretary, H. R. Schenk, architectural engineer, Dayton; treasurer, F. O. Clements, director, Dayton Research Laboratories, Dayton. The new club house is the gift of Col. E. A. Deeds and C. F. Kettering.

Foundry Foremen Elect

The Associated Foundry Foremen of New York, 355 West Twenty-sixth street, New York City, have elected the following officers for the ensuing year: President, Walter H. Hofmann, foundry superintendent, Richey, Brown & Donald Co., Maspeth, N. Y.; vice president, Robert Walker, foundry superintendent, Abendroth Bros., Port Chester, N. Y.; secretary-treasurer, Walter F. Kaine, president T. P. Kelly & Co., New York City. In addition, the following directors were elected: Charles Ashurst, superintendent Fuchs & Lang Mfg. Co., Rutherford, N. Y.; James Bolland, superintendent, E. W. Bliss Co., Brooklyn, N. Y.; A. W. Braun, president, Edgewater Foundry Co., Edgewater, N. J.; John J. Jung, treasurer, Charles A. Lefferts & Co., iron froundry, Brooklyn, N. Y.; Fred R. Powell, president, West Bergen Iron Foundry, Jersey City, N. J.; John A. Rylance, treasurer, Burr & Houston Co., Brooklyn, N. Y.; William S. Rutherland, superintendent, Lord & Burnham Co., Irvington, N. Y.; D. C. Wilson, superintendent, Aetna Foundry Co., Philadelphia; Walter H. Hofmann; Robert Walker, and Walter F. Kaine.

At the meeting at which the election of officers took place, George N. Moore, Robeson Process Co., 18 East Forty-first street, New York City, delivered an address on core binders.

Consider Shipyard Scales

Various officials of shipbuilding companies with yards along the Delaware river and representatives of workmen met for the first time recently in Philadelphia. Wages and working conditions were some of the items discussed. This conference was held at the request of the National shipbuilding labor adjustment board for the purpose of deciding the most satisfactory method of making wage payments, whether by hourly or piece rates. On the result of the conference, the adjustment board plans to base the wage scales for the Philadelphia district.

Coke Output of Last Year Exceeds 1916 Figures

The total output of coke in the United States in 1917, including both beehive and by-product, is estimated at 56,600,000 tons, as compared with 54,550,000 tons in 1916. According to the United States geological survey of this, beehive coke constituted 60 per cent and by-product 40 per cent.

The total beehive output for the completed year was 33,994,833 net tons, or 1,470,000 tons less than for 1916. The decrease, amounting to 4.3 per cent occurred simultaneously with an increase in the demand for coke, and is to be accounted for in part by the effect of car and labor shortage in limiting output, but chiefly by the successful competition of by-product coke. Preliminary estimates place the production of the latter at 22,600,000 tons, a gain of 3,531,000 tons over 1916, or 18.5 per cent. By-product ovens have thus not only supplied the additional consumption induced by the growth of industry, but have displaced nearly 1,500,000 tons formerly supplied by beehive ovens.

To build a tunnel under the Mogi straits, Japan, starting at Shimonoseki and ending at Dairi Fukuoka Prefecture, is the intention of influential citizens of Fukuoka, Kiusha, who will form a company with capital stock of $7,228,250. This tunnel will be connected with the railway trunk line at Kiushu and will be 17,700 feet long. It will extend for 4000 feet beneath the sea and will require five years to complete.

Advantages of Case Hardening

The following letter was recently received from Henry F. Taylor, Reading Screw Co., Norristown, Pa., in reference to certain statements made by E. F. Lake in an article entitled, "Limitations of the Carbonizing Process", published in the Dec. 27, 1917, issue of THE IRON TRADE REVIEW.

The writer read with interest the article entitled "Limitations of Carbonizing Process", in which he notes the writer does not seem favorably inclined towards the carbonizing process.

The fundamental objects to be attained in the case-hardening process are:

(1) A sufficient addition of carbon to the outside wall of the metal in order to adapt it, after the proper hardening and tempering treatments, to the class of work it has to perform.

(2) A tough and soft core which insures a long life to the piece treated.

Failures in case-hardening are largely due to the fact that the outer surfaces of the metal have not been treated consistently in regard to the strain to which the piece is subjected. The writer has obtained ideal results on pieces used in the manufacture of wood-screws by quenching the parts in an oil bath composed of fish and boiled linseed oil, and then drawing the temper from 350 to 450 degrees Fahr., as the case may require. This reheating always refines the grain and aids in eliminating a sharp line of demarcation between the carbonized zone and the core. For instance, take machine screws, such as used on automatic screw machines. * * * * They can be made from a low carbon steel and heat-treated to the proper consistency, as described above.

Duplicate machine parts can be cast as a commercial product from a composition of 40 to 50 carbon, and after being case-hardened properly, will hold up their end against parts made of alloy steel.

Without a doubt the case-hardening game is here to stay and is proving its worth.

(Signed) Henry F. Taylor.

Army to Use Metric Units

Announcement has been made by the war department that hereafter the metric system of measurement will be the standard for all artillery, machine guns and maps for the American overseas forces. The change was made upon the suggestion of the French government.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

WALTER A. BARROWS JR., who was recently elected president of the Eastern Pig Iron association has been president and general manager of the Thomas Iron Co., Easton and Hokendauqua, Pa., since Sept. 1, 1916, when he succeeded Ralph W. Sweetser, resigned. Born in Cold Spring, N. J., in 1865, Mr. Barrows trained as a chemist at Rutgers college, New Brunswick, in that state and in 1886 became associated in that capacity with the Sharpsville Furnace Co., Sharpsville, Pa. He later held similar positions with the Clair Furnace Co., and Perkins & Co., Ltd., of that city. In 1897, he became superintendent of the blast furnace department of the Mahoning Valley Iron Co., Youngstown, O., and at the end of two years, assumed the duties of superintendent at the Everett furnace, Everett, Pa. For eight years from 1900 to 1908 he served as general manager for the Shenango Furnace Co., Sharpsville, Pa., and then became metallurgist for the Northern Pacific Railway Co., remaining there until the end of August, 1916, when he was appointed president of the Thomas Iron Co.

George E. Shaw has been elected a director of the Crucible Steel Co., of America, Pittsburgh.

E. Cooper Wills was recently appointed superintendent of the Rahway, N. J., plant of the Nagle Steel Co., Pottstown, Pa.

Frank Samuel, of the firm of Frank Samuel, Philadelphia, has been appointed a member of the subcommittee of ferroalloys of the American Iron and Steel institute.

J. H. Foster, affiliated with the Hydraulic Pressed Steel Co., Cleveland, has been named chairman of the war industries committee of the Cleveland chamber of commerce.

J. M. Homs, who has been manager of the export sales department of the Four Wheel Drive Automobile Co., Clintonville, Wis., resigned recently to become associated with his brother in the export business in New York City. C. S. Thompson of Chicago, has been appointed to succeed him.

Thomas B. Davies, formerly connected with the Carnegie and Pittsburgh steel companies, but more recently with the sales force of the Central Steel Co., Massillon, O., has been appointed district sales representative for that company in its recently opened branch office at Syracuse, N. Y., 621 University building.

Colonel Stanhope E. Blunt, who formerly was commandant of the United States armory, Springfield, Mass., has

WALTER ALMER BARROWS JR.

been made supervisor of manufacturing arsenals in the United States.

J. Funkhouser has been made assistant manager of the New Castle, Pa., works of the American Sheet & Tin Plate Co., from that company's plant at Gary, Ind.

C. E. Goodfellow, who recently resigned as assistant to the superintendent of the Donner Steel Co., Buffalo, is now in the government's service in the aviation squad at San Antonio, Tex.

Arthur Todd Kennedy, who for many years served as mining engineer for the Republic Iron & Steel Co., is now in France. He commands a company of the 23d engineer corps.

J. R. A. Hobson has been made vice president and director of the Tredegar Iron Works, Richmond, Va., and will move to that city in the near future. He has been general manager of the Southern Telephone Co., Evansville, Ind., for several years, moving to that city from Atlanta, Ga.

R. J. Morgan has been promoted from the position of supervisor of sales for the American Steel Export Co., Woolworth building, New York City, to that of assistant general manager of sales.

C. C. Smith, president of the Union Steel Casting Co., Pittsburgh, has received a commission as major in the ordnance bureau of the war department. He has reported for active duty at Detroit.

William R. McCulla is now affiliated with the aircraft division of the Willys-Overland Co., at Elmira, N. Y., and Toronto, Ont., having resigned as aircraft motor engineer of the Packard Motor Car Co., Detroit.

E. V. Douglass, who for the past five years has been secretary of the American Manufacturers' Export association with headquarters at 160 Broadway, New York, has resigned and will enter private business.

Captain Richard R. Trezona was recently tendered a banquet by friends and fellow-employes upon his retirement as general superintendent of the Fayal district for the Oliver Iron Mining Co., which position he has held for 17 years.

H. H. Barbour, who has been district sales manager for the Lackawanna Steel Co., at New York and who has been serving with the priorities committee of the war industries board of the council of national defense has been made chairman of the rating committee of the priorities division. His headquarters are in the Council of National Defense building at Washington.

William Pigott, president of the Seattle Car & Foundry Co., and vice president of the Pacific Coast Steel Co., since July, 1917, has been named by the United States shipping board to take charge of wooden shipbuilding at Seattle.

William J. Wood, naval architect, Chicago, has been appointed inspecting naval architect, division of wood

ship construction, United States Shipping Board Emergency Fleet Corp. Mr. Wood's office is at 1029 Munsey building, Washington, D. C.

Frank Bartholomew, who served as erecting engineer for the Shaw Electric Crane Co., for 20 years and who resigned in December, is now associated with N. B. Payne in the Havermeyer building, 25 Church street, New York, as a specialist in electric cranes.

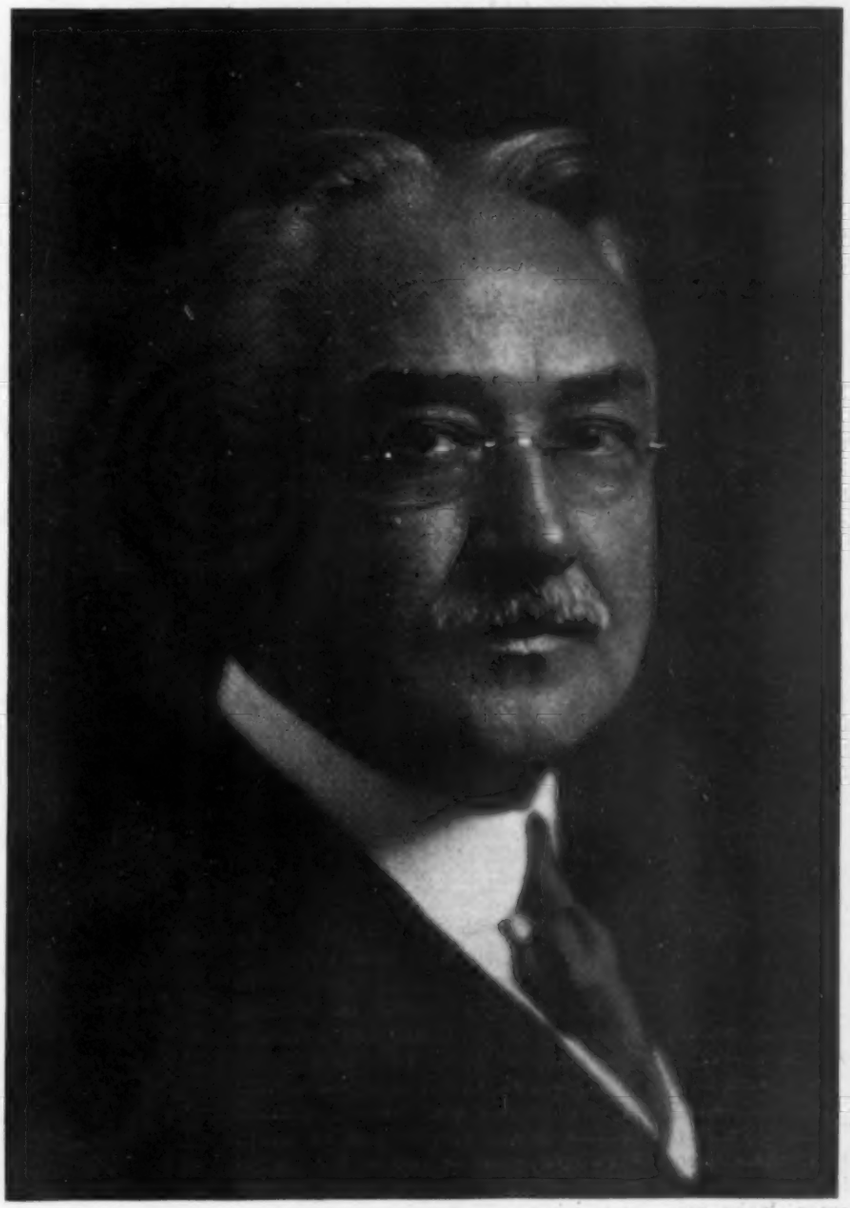
R. Sanford Riley, who is president of the Sanford Riley Stoker Co., Ltd., Worcester, Mass., and Detroit, and director of the Norton Co., and the Norton Grinding Co., Worcester, Mass., has been elected president of the chamber of commerce at Worcester, for the enusing year.

W. I. Seigle was elected vice president of the H. W. Johns-Manville Co., New York City, at a recent meeting of the board of directors, which consists of the 1917 directors re-elected and Wm. T. Klauss was recently elected a director.

Edward R. Stettinius

Who Will Serve as Purchasing Agent for World's Greatest Buyer — the U. S. Army

EDWARD R. STETTINIUS, who was recently appointed surveyor general of supplies for the army by Secretary of War Baker, has had a more comprehensive experience perhaps for such a position, than any man in the United States at the present time. When J. Pierpont Morgan & Co., on Jan. 15, 1915, became purchasing agents for the allies in this country, they retained the president of the Diamond Match Co., Chicago, in an advisory capacity. Inside of a year, because of demonstrated ability, he was admitted as a partner, and was given direct charge of purchasing $3,000,000,000 worth of supplies for the allies. This multitudinous business was transacted with despatch and without friction. Born in St. Louis, Feb. 15, 1865, he located in Chicago in 1892. After a brief experience in the stock brokerage business, Mr. Stettinius became treasurer of the Stirling Co., boiler manufacturers. When hard times nearly forced that company on the rocks, he assumed the duties of general manager, collection manager and chief salesman and by his efforts, it won out. In 1905, the Stirling Co. was consolidated with the Babcock & Wilcox Co., Chicago. Here his energy and ability attracted the attention of Chicago capitalists who formed the Diamond Match Co., and they made him a member of the board. Later he was elected treasurer and in 1909 was made president. He held this office for a time after Morgan & Co. became official purchaser for the allies in this country. In explaining his success both as advisor to and partner of that firm, Mr. Stettinius characteristically states: "We considered that 97½ per cent of the efficiency of the plants lay in the men at their heads and only 2½ per cent in the bricks and machinery." By Secretary of War Baker's selection, Mr. Stettinius now has charge of procurement and production of all supplies required by the ordnance, quartermaster, signal, engineer and medical departments of the United States army. He will assume his new duties at once and will establish an office in Washington. While all his time will be given to government work, he will retain his partnership in J. P. Morgan & Co., New York City.



EDWARD R. STETTINIUS

Solving Housing Problem

How Seattle is Attacking Task of Providing Accommodations of Thousands of New Workmen for Government Shipbuilding

SEATTLE, Wash., Jan. 26.—Seattle is to turn out 600,000 tons of steel shipping and several hundred thousand tons of wooden shipping during 1918. In order to do this, some 15,000 or 20,000 skilled workers are to be added to the 15,000 now working in the yards. Through the instrumentality of the government these men will begin arriving in large numbers in February. The transportation of workers is an acute problem and one that is being worked out by experts at the present time. Following close upon this is the question of housing all these men who are coming, if they are to be kept in the city. If it should happen that adequate housing accommodations cannot be supplied, the men, particularly those with families, are likely to turn elsewhere.

While the government in a general way has taken cognizance of the necessity for housing in an adequate manner the workers who are flocking to the great shipbuilding centers, the problem insofar as it relates to Seattle requires immediate action. With this idea predominating, the same speed with which the transportation of workers to and from the yards was taken in hand is being shown by civic bodies, companies and individuals in the new problem which is to become pressing at once. In other words, it is being made a local issue.

The Seattle chamber of commerce and Commercial Club is taking an active part in securing such action as will meet the needs of the workers as they arrive. B. L. Lambuth is chairman of the permanent homes division of the general housing committee of this body. By permission of representatives of the United States department of labor and the United States shipping board, who are in Seattle to establish an emergency employment service to procure labor for shipyards and other war essential industries, Mr. Lambuth has given out a statement made by his division of the committee.

The summary of this statement is as follows:

"The permanent homes committee recently organized consists of representatives of every organization in Seattle having to do with the financing and erection of house. Master builders, architects, real estate men, mortgage loan men, investment bankers, engineers, lumbermen, labor representatives and public officials have all combined their efforts to solve the housing problem.

"Very satisfactory progress has been made. A building program greater than that for the entire year 1917 will be carried through within the next 90 days. This much is already certain. In the meantime, plans are being completed and will be presented to the property owners and the public within the month which will insure as much additional construction as may be required by the shipping board.

"Plans which are being prepared call for a high grade of construction and permanently satisfactory housing conditions. Forty-foot lots will be the prevailing standard. Four, five and six-room houses costing from $1400 to $2200 are favored. Complete with all street improvements these homes will sell on easy terms at from $2000 to $3000."

The problems of transportation, finding and construction are receiving attention. Tables of cost, demand and available sites are being prepared. The machinery for obtaining adequate supplies of labor and material for checking speculation is being completed.

Aside from the work being done by this committee, residence construction generally has been greatly stimulated and permits for residences are being issued in increasing numbers. The universal desire in the city to meet the necessity as it arises indicates that as the workers arrive adequate housing accommodations will be available and the industry will not be disturbed by the constant removal of men to other fields.

Open Drive for Thousands of Shipyard Workers

Washington, Jan. 28.—A coast-to-coast drive for shipbuilders commenced on Monday of this week, when 20,000 "four minute" men started a two weeks educational campaign to explain the importance of shipbuilding to our war program. On Feb. 11, "national shipbuilders' registration week" begins, and it is expected that at least 250,000 men will be enrolled in this public service reserve which the employment service of the United States department of labor will draw upon when calls for labor come from any shipyard in any section of the United States. Since in this effort, the United States shipping board, the council of national defense and organized labor will co-operate, all competition will be eliminated, independent efforts heretofore resulting in no small measure of demoralization.

During registration week, the several hundred thousand men enrolled will be interviewed by traveling examiners sent out by the United States employment service. The exact experience and fitness of each man will be ascertained. Each of the 48 states has been allotted a certain quota and in the northwest the direction of the campaign is in the hands of I. W. Litchfield, Boston, an associate director of the public service reserve. Sanford H. E. Freund, St. Paul, has charge of the middle west and the east and south is handled direct from Washington headquarters.

Dominion Output Drops

A slight falling off in tonnage production of the Dominion Steel Corp., for 1917, as compared with 1916, is shown by the following table:

	1917	1916
Pig iron	341,000	348,000
Steel ingots	353,000	376,000
Blooms, billets, etc.	154,000	150,000
Rails	16,000	17,495
Wire rods	100,000	112,400
Merchant bars	1,300	9,950
Wire and wire products	35,700	47,500
Iron ore	651,000	.....
Limestone	524,000	.....

During 1917, the reconstruction of a 400-ton blast furnace was undertaken, which will be ready for operation in March. It is anticipated that about the same time, the construction of 120 Kopper's by-product coke ovens will be completed. The work of improving the electrical power and water supply equipment of the plant will be pushed to completion as quickly as possible.

Will Repair Furnaces

With the payment of all back dividends, the Alabama Co., Birmingham, Ala., has commenced development plans. E. N. Rich, of Baltimore, the company's president, spent several days recently inspecting the properties. A furnace at Gadsden, Ala., will be rebuilt and another stack thoroughly repaired.

Institute Booklet Out

The American Iron and Steel institute has issued its official list of maximum prices on iron and steel products with differentials and extras. It is in the form of a 4 x 7-inch, 106-page

booklet which now is ready for distribution. One copy is being sent to each member of the institute and many members are receiving a number of copies each for office use, in accordance with requests made in response to the general circular recently sent out. Extra copies will be furnished to members at 50 cents each. The booklets may be obtained from the institute's headquarters at 61 Broadway, New York.

Doubles Car Output

To double its original tank car production capacity, the Standard Car Construction Co., operating a plant near Masury, O., has completed an extension to its plate shop, 122 x 200 feet, and has made the necessary machinery installations. Twenty cars is the daily capacity, but owing to labor and material shortage the output is limited to about 12 daily. The capital stock has been increased from $1,000,000 to $2,000,000, proceeds of the new issue being used for plant extensions and working capital.

Takes Tool Order

The Amalgamated Machinery Corp., Chicago, has been awarded a three-quarter million dollar order for gun-boring lathes, and a half-million dollar order for shell-boring machinery. Owing to the company's capacity of about ten of these tools daily, it will be able to fill the order within comparatively brief period.

New Engineering Firm

The engineering business of Thornton W. Price, New York, will be carried on under the name of the T. W. Price Engineering Co. Mr. Price, president of the company, is well known as a designer and constructor of steel plants and foundries. The work carried on under his supervision during the past few years includes many large steel plants and foundries. Among the former are a number of electric steel forging and rolling mill plants, including the Ludlum Steel Co., Watervliet, N. Y., and the Hammond Steel Co., Syracuse, N. Y. His organization has handled not only the laying out of these plants, but also the superintending of the construction, installation of machinery and development of new labor-saving devices. The main office of the company will be in New York City. The Philadelphia office has been enlarged and a new office has been opened in Chicago.

Dansk Staalindustri is the firm name of the recently combined companies: The Danske Staalvarefabrik at Lyngby, Denmark and Elektrostaal, the new steel works at Buddinge. The capital stock is $1,000,000 and Harald Plum is president.

Iron and Steel Furnishes Large Army Quota

From Provost Marshall General Crowder's Annual Report

	Industry	Population engaged in industry	No. of men registered	No. of men called	No. of men accepted	Ratio*	Claims**	Allowed	Ratio**	Still available for draft
1.	Agriculture	13,843,518	2,439,246	782,503	205,731	1.48	75,170	28,776	38.3	2,233,515
2.	Forestry	200,991	78,241	24,507	7,984	3.97	274	106	38.8	70,257
3.	Animal husbandry..	227,325	76,646	15,642	4,570	2.01	1,602	540	33.7	42,076
4.	Coal mines	600,148	225,109	74,109	18,710	3.12	2,601	851	32.7	206,399
5.	Other mines (a)....	275,561	92,062	35,553	10,377	3.77	540	218	40.6	81,684
6.	Oil, gas wells.....	51,223	33,040	10,610	3,026	5.91	367	147	39.9	30,014
7.	Building	2,878,792	700,790	231,835	57,970	2.01	3,256	1,495	45.9	642,820
8.	Explosives (b).....	10,307	25,999	9,692	2,310	22.41	2,878	1,810	62.9	23,689
9.	Chemicals	80,331	24,946	7,986	1,926	2.40	700	389	55.6	23,020
10.	Clay, glass, stone...	246,072	74,580	24,928	6,022	2.45	404	136	33.7	68,558
11.	Clothing	754,062	114,687	44,952	7,370	.98	574	176	30.7	107,317
12.	Food	396,519	160,709	50,929	11,687	2.95	2,021	657	32.5	149,022
13.	Iron and steel (c).	373,701	241,145	92,434	22,068	5.90	10,205	7,245	71.0	219,077
14.	Shipyards (d).....	62,071	35,949	11,910	2,628	4.23	3,824	2,671	69.9	33,321
15.	Mfg. steel (e)....	822,540	310,318	102,860	24,857	3.02	4,201	2,184	52.0	285,461
16.	Leather	343,805	81,575	24,663	5,063	1.47	538	168	31.2	76,512
17.	Liquors, all.....	89,190	17,669	5,752	1,472	1.65	55	9	15.4	16,197
18.	Lumber products...	541,926	145,379	43,144	11,458	2.11	653	163	25.1	133,921
19.	Metals	268,537	123,992	46,480	10,182	3.79	2,376	1,395	58.7	113,810
20.	Paper and printing..	507,986	101,750	30,711	6,745	1.33	379	74	19.1	95,005
21.	Textile	919,800	155,938	52,462	9,833	1.07	1,054	407	39.2	146,105
22.	Miscellaneous (f)...	1,254,361	275,679	87,780	22,089	1.76	5,179	2,716	52.4	253,590
23.	Railroads	1,236,867	277,018	85,063	21,557	1.74	5,256	1,823	34.7	255,461
24.	Wire communic.....	297,067	66,119	20,128	4,955	1.67	1,925	1,032	53.6	61,164
25.	Other trans.....	1,297,132	400,513	128,262	34,565	2.67	1,619	583	35.8	365,948
26.	Gen. business (g)...	4,708,908	364,151	111,541	24,892	.53	4,403	654	14.8	339,259
27.	Public service.....	529,315	335,053	106,068	23,606	4.46	1,255	368	29.3	311,447
28.	Professional	2,202,609	383,140	119,448	30,082	1.37	4,842	748	15.3	353,058
29.	Domestic (h).....	4,208,862	977,853	297,348	78,221	1.86	1,839	476	26.0	899,632
30.	Laborers	4,053,385	1,277,213	403,649	114,955	2.84	902	219	24.3	1,162,258

*Accepted to population; **For exemption; ***Allowed to claims.

(a) Including iron and nonferrous ore mines; (b) disparity in population and registered figures due to estimate fallacy; (c) blast furnaces, steel rolling mills, iron foundries, military weapon factories; (d) included in report's iron and steel group; (e) agricultural implement, automobile, wagon and carriage factories, car and railroad shops, and other iron and steel factories; (f) includes coke and electrical appliance plants; (g) banking, brokerage, trading, general merchandise, etc.; (h) barbers, porters, waiters, bartenders, etc.

Industries 4 to 22 inclusive are classified as manufacturing industries.

Iron and Steel Financial News

Up-to-the-Minute Fact and Comment Collected and Sifted For Busy Readers

Clear Up Obscure Points in Tax Forms

AT PRESENT the American public is beginning to have its first real taste of war taxation, for between now and March 1 all returns must be made of incomes for 1917. The new form 1040 prepared by the bureau of internal revenue at Washington is rather complex and has given rise to a number of questions. For the information and assistance of taxpayers, the bureau of internal revenue has prepared an "Income Tax Primer". This "primer" is arranged in question and answer style and is asserted to contain the government's full instructions on the income tax. A resolution adopted by the house of representatives on Jan. 10 ordered 38,910 copies to be printed. One section of interest relates to the difference between bonuses and Christmas remembrances. While bonuses are taxable, it is set forth that "Christmas remembrances, anniversary gifts, etc., from an employer to an employe do not constitute such items as are subject to the income tax."

Dividend Notices Perplex

Many stockholders of corporations have been perplexed by the receipt of notices reading something like this:

"You are advised that the dividend of $6 a share, paid to you on June 30, 1917, was declared out of surplus accumulated in the year 1915."

Or perhaps the notice read like this:

"You are hereby informed that the dividend of 7 per cent of this company, which was paid you on July 31, 1917, was a distribution of surplus accumulated as follows: 75 per cent in the years 1914 and 1915 and 25 per cent in 1916."

This procedure results from section 31 of the war revenue act of 1917, which taxes dividends declared out of surplus at the rate of tax prescribed for the year in which the surplus so distributed was acquired. Consequently such dividends are taxable only where the individual is in the surtax class; in other words, where his income exceeded $20,000 in the years 1913, 1914, 1915, 1916, or $5000 in 1917. Block F of form 1040 relates to this phase of income taxing.

Dividend Tax Explained

Collector Mark Eisner, of the third of upper Manhattan revenue district, New York City, has prepared a statement explaining taxes on dividends, in which he has incorporated some examples, one of which follows:

Assume an individual with a net income shown in Item, O., to be $25,000 in 1917. He received in 1917 as dividends $50,000, which were paid out of surplus accumulated as follows:

1913	1914	1915	1916	1917
$10,000	$13,000	$12,000	$15,000	*$25,000

*Net income.

Add the $15,000 of dividends of 1916 to the net income for 1917 and the result is $40,000. The rates of surtax for 1916 were 1 per cent on the net income over $20,000, and under $40,000, and 2 per cent over $40,000 and under $60,000.

Taking the $40,000 which was obtained by adding the 1916 dividend to the 1917 income, we find ourselves first in the surtax class of $20,000 to $40,000. Exempt the $25,000 income of 1917, there remains $15,000 taxable at 1 per cent, or a tax on the 1916 dividend of $150.

Now, the surtax rates for 1913, 1914, and 1915 are the same, so we can total the dividends for those years, which results in the sum of $35,000. Add this to the $25,000 net income for 1917, and the $15,000 dividend for 1916, and the result is $75,000. The surtax rates for 1913, 1914, and 1915 were 1 per cent on income between $25,000 and $50,000, and 2 per cent between $50,000 and $75,000.

Now, exempt the 1916 dividend of $15,000 and the net income of $25,000 for 1917, totalling $40,000, and we find remaining $10,000 taxable at 1 per cent, (surtax class of $25,000 to $50,000), or a tax of $100. Between $50,000 and $75,000 there still remains therefore to be taxed at 2 per cent (rate for surtax class $50,000 to $75,000), $25,000 of the 1913, 1914, 1915 dividends, making a tax of $500. The total tax paid, therefore, in this case is $750, made up of $150 on account of 1916 dividend and $300 on 1913, 1914, and 1915 dividends.

Extends Income Filing

Approval of a ruling extending the provisions of treasury decision 2615 of Dec. 13, 1917, which granted an extension of time in which to file returns of annual net income of certain corporations has been accorded by Secretary McAdoo. The text of the ruling follows:

"The provisions of treasury decision 2615, Dec. 13, 1917, extending the time to Feb. 1, 1918, to corporation filing returns for war income and war excess profits taxes, pursuant to the act of Oct. 3, 1917, on the basis of a fiscal year ended on the last day of some month during the year 1917 (except Dec. 31, 1917) are hereby amended so as to extend the time of filing such returns until March 1, 1918. This extension applies also to returns of annual net income of such corporations which were due subsequent to Oct. 16, 1917, the date of treasury decision 2561 (extending the time to Jan. 1, 1918), but prior to March 1, 1918."

Favorable Trade Balance is Increased Greatly

A gain of $100,000,000 in America's foreign trade in December over the previous month, brings the total for 1917 to the enormous sum of $9,178,000,000. In view of the generally assumed shortage of bottoms, this announcement by the government creates surprise. December's total was $598,000,000, as compared with $498,000,000 for November, and the official figures for the year show a gain of $1,300,000,000 over 1916. Exports for 1917 aggregated $6,226,000,000, while imports totaled $2,952,000,000, free imports forming 72 per cent of the total. For 1917, the balance of trade in favor of the United States nearly doubled the 1915 figure of $1,776,000,000, being $3,274,000,000.

Organize Ship Works

The Universal Shipbuilding Co., Sturgeon Bay, Wis., which recently was incorporated with an authorized capital stock of $1,500,000 to exercise an option taken by Gustav A. Huck on the business of Rieboldt & Wolter, shipbuilders, Sturgeon Bay, has per-

fected its organization by the election of the following officers: President, Philip Binzel, Oconomowoc, Wis.; vice president, Gustav A. Huck, Sturgeon Bay; second vice president, Hubert Riesen, Milwaukee; secretary, Louis Liebscher Jr., Milwaukee; treasurer, Herbert L. Peterson, Sturgeon Bay; directors, Max Grefig, Walter E. Pommer, Ignatz Wetzel and Theodore C. Froemming, all of Milwaukee. The Rieboldt & Wolter yard passes into the ownership of the new company on Feb. 1, but the present owners will complete the government transport, No. 61, now on the stocks. When this is launched, about May 1, the new owners will start to make extensive improvements, including the addition of several new and larger berths, new machine shops, and other construction.

Merchandise Exports and Imports Decrease

Both exports and imports of merchandise fell off a trifle in November, according to the bulletin issued by the bureau of foreign and domestic commerce. The total November exports were $488,240,626, while October's were $543,232,000. Imports were $220,533,575 for November as against $221,239,405 for October. Excess of exports over imports for the 12 months ending Nov. 30 continues to mount. In 1915 this excess was $1,719,576,308, in 1916 it was $2,960,080,031, while in 1917 it was $3,232,661,820. Total exports for the first eleven months of the three years were $3,195,364,485, $4,959,407,321 and $5,638,829,711, respectively, while imports in the same periods were $1,606,764,190, $2,186,801,147 and $2,724,567,483, respectively. The month of December, however, will add considerably to these totals, since the figures for the year ending Nov. 30, 1915, 1916 and 1917, respectively, are $3,440,997,043, $5,318,713,683 and $6,162,063,491 for exports and $1,721,420,735, $2,358,633,652 and $2,929,401,671, respectively, for imports.

Financial Crop Ends

To provide for the requirements of the rapid growth of the La Crosse Tractor Co., La Crosse, Wis., stockholders in its recent annual meeting voted to increase the capital stock to $2,500,000.

* * *

At a recent annual meeting of the Youngstown Foundry & Machine Co., Youngstown, O., the following officers were elected: W. J. Wallis, president; F. A. Williams, vice president and sales manager; B. G. Parker, secretary and treasurer. These with A. E. Adams, E. Hartzell, H. P. Parrock and S. K. Hine comprise the board of directors. This company is building a 10-inch bar mill for the Carnegie Steel Co., to be installed at McDonald as well as 8-inch and 10-inch mills for the Donner Steel Co., Buffalo.

* * *

The Stalnaker Steel Co., Farmers' Bank building, Pittsburgh, scrap dealer, has purchased the business of the Duquesne Iron & Metal Co., which operates a scrap yard on the North Side, Pittsburgh.

* * *

The Emergency Fleet corporation has taken from George W. Smith & Co., Inc., Philadelphia, a mortgage of $450,000 for financing the operation of a plant at Forty-ninth street and Botanic avenue, in that city.

* * *

Harrington & Richardson Arms Co., Worcester, Mass., elected these officers at its annual meeting, Jan. 22: Edwin C. Harrington, president; George F. Brooks, secretary and treasurer; the foregoing and John W. Harrington, directors.

* * *

Henry Fletcher and Joseph P. Burlingame, receivers for the Metal Products Corp., Providence, R. I., have sold their land and buildings on Blundell street, Thurbers avenue and Eddy street, in that city, to the E. M. Dart Mfg. Co., for $61,000, subject to mortgages, aggregating $39,000.

* * *

The Reed & Prince Mfg. Co., Worcester, Mass., machine screw products, at its annual meeting, elected the following officers for the ensuing year: Edward Reed, president; E. Howard Reed, vice president; William L. Ames, treasurer; Chester T. Reed, secretary and E. W. Reed, clerk.

* * *

The Portage Silica Co., Youngstown, O., elected the following officers at the recent annual meeting: J. G. Butler Jr., president and treasurer; E. E. Klooz, vice president and general manager, who with H. A. Butler, C. E. Hoffmeister, J. B. Chambers, F. R. Kanengeiser and Bruce Campbell serve on the board of directors.

* * *

R. V. Mattison Jr., Ambler, Pa., who purchased the Longmead Iron Works property in Conshohocken, Pa., some time ago, has sold a portion of it to Ford & Kendig, Philadelphia, manufacturer of iron pipe and steam specialties. The portion which will be occupied by Ford & Kendig, formerly was occupied by a tube works and puddle and skelp mills.

* * *

The Franklin Railway Supply Co., and the Economies Devices Corp., have been merged into the Franklin Railway Supply Co., Inc., New York. J. S. Coffin has been made chairman of the board of directors and S. G. Allen is vice president. The other officers follow: H. F. Ball, president; Walter H. Coyle, senior vice president; J. L. Randolph, vice president in charge of western territory; C. W. Floyd Coffin, vice president in charge of eastern and southern territory, and C. L. Winey, secretary and treasurer.

Foundry Capacity

Of Country to be Surveyed by War Committee of Industry

The war service committee of the American Foundrymen's association has appointed C. E. Hoyt, of Chicago, secretary and has established offices in the National Union building, 918 F street, N. W., Washington. From these headquarters will be directed all of the committee's activities in connection with co-operation with the government. Subcommittees on malleable and gray iron castings already have been named and a subcommittee on nonferrous castings is being selected. A questionnaire has been prepared and will be mailed out to all of the foundrymen of the United States and from the data thus obtained, a survey of the foundry trade of this country will be made. Information is being sought on the melting equipment, capacity, fuel capacity, etc., of all castings plants, and when compiled this information will be available to all of the purchasing agents of the different government

R. A. Bull, Duquesne Steel Foundry Co., Pittsburgh, chairman of the American foundrymen's war service committee and a major in the officers' reserve corps, has resigned, having been called for active duty. He has been succeeded by H. D. Miles, vice chairman, Buffalo Foundry & Machine Co., Buffalo.

The malleable and gray iron subcommittees already appointed are constituted as follows:

Malleable Iron—Frank J. Lanahan, Fort Pitt Malleable Iron Co., Pittsburgh; H. F. Pope, National Malleable Castings Co., Cleveland; F. L. Sivyer, Northwestern Malleable Iron Co., Milwaukee; John E. Walker, Wilmington Malleable Iron Co., Wilmington, Del.; John C. Haswell, Dayton Malleable Iron Co., Dayton, O., who also is a member of the general committee representing the malleable cast iron industry.

Gray Iron—Henry A. Carpenter, General Fire Extinguisher Co., Providence, R. I.; W. D. Tynes, Hardie-Tynes Mfg. Co., Birmingham, Ala.; F. B. Whitlock, Interstate Foundry Co., Cleveland; W. P. Whelan, Western Foundry Co., Chicago.

Briggs & Turivas, scrap iron and steel dealers, Chicago, is sending out to the trade a gross and net ton equivalent price card which carries prices to $50.75. Inasmuch as previous cards of this sort have been computed only to $25, this new table will be of much convenience as the market now is at much higher levels.

Push Ordnance and Airplane Work

Government Aids Builders of Tools for War Work of Pressing Importance—Crane Awards Approximate 50 of Various Types—New England Shipbuilding Company to Buy Equipment Aggregating $700,000

AMERICA is preparing for the much-vaunted spring offensive of the Teutonic allies and the government is rushing immediate preparations which are calculated to stem the impetus of the thrust. In any event, considerable significance is attached to the order of the fuel administrator during the five-day period when the suspension of manufacturing activities in various industries was made mandatory, in that only machine tool builders engaged in the production of equipment for ordnance and airplane work were permitted to operate unhampered; the activities of those building tools for destroyer work or cargo ships being restricted. The recent huge inquiries from the government for planers, lathes, boring mills and other tools, may have a deterring influence on dealers' activities. Dealers' deliveries may be seriously affected and a consequent diminution of buying from makers of nonessentials may result.

Great activity prevails in the New York crane market. A New England shipbuilding company has been awarded a contract for 10 steel ships and has announced that approximately $700,000 will be spent for equipment. A New York interest is inquiring for several cranes for shipment to France, to be used there in shipyards. Contracts for approximately 50 cranes of various types have been awarded during the past week. Included among these awards was a contract for five overhead traveling cranes of five to 100 tons capacity for the Washington navy yard to a Cleveland crane builder; a contract for 20 locomotive cranes to another Ohio builder; an award of nine overhead traveling cranes to a Pennsylvania builder; two to a Milwaukee builder, and others.

Crane Allotments Increase in Size and Number

ALTHOUGH the production of machine tools for use in cargo shipbuilding was at first exempted from the closing order of the fuel administrator, this exemption was removed and departments devoted to such manufacture henceforth will be closed on the workless Mondays. However, manufacturing of machines needed for ordnance work is not to be interfered with; likewise manufacture of tools needed for airplane production is exempted from the closing rule. Strange to say, work on machines needed for the destroyer program is not exempted, although heretofore the destroyer program has received precedence over everything else.

Pushes Work on Projects Now Under Way

Few new developments of importance are appearing in the machinery markets. The government is more interested in pushing to completion the many undertakings already instituted than to begin anything new. The market is so well cleaned out of many needed machines that it is useless to issue long lists of machines needed. Prospective buyers are shopping around and picking up what they can here and there. The machinery section of the war industries board is appealing to manufacturers to sell, rent or loan to the government machines of various types now urgently needed for war work.

Fore River Corporation Buys 85 Lathes

The Fore River Shipbuilding Corp., Quincy, Mass., is reported to have awarded the contract for 85 precision lathes wanted for installation aboard destroyers. The E. W. Bliss Co., Brooklyn, last week inquired for 25 bench lathes. The navy department at Washington is inquiring for a power press, lathes and elevator truck for torpedo work at the Puget Sound navy yard. It is rumored that the government is planning to build a second ordnance base depot in France, to be a duplicate of the first one which now has been under way for some time. The Federal Shipbuilding Co., 54 Dey street, New York closed for about $100,000 worth of machines from the J. K. Stewart plant in Long Island, offered on the market by Carpenter & Woodward, 233 Broadway, New York.

Shipyard Growth Supplies Crane-Buying Stimulus

Crane builders at this time are devoting considerable attention to the requirements of the Atlantic Corp., Portsmouth, N. H., which recently received a contract from the government for the erection of 10 steel ships. The company has closed on a large quantity of miscellaneous equipment, but is understood to be contemplating the expenditure of $700,000 for additional machinery, including several cranes. The Groton Iron Works, which is equipping a yard at Alexandria, Va., has issued an inquiry for four 5-ton electric cranes, with 80-foot span, and will enter the market for additional equipment in the near future. The company is expected to close on its plate and angle ship requirements this week. Martens & Co., New York, exporters, are inquiring for several cranes for shipyards in France. The Worthington Pump & Machinery Corp., Holyoke, Mass., is in the market for a 10-ton electric crane. The government is asking bids on 25 1-ton triplex chain hoists for the American ordnance base depot in France. It also is inquiring for four 1-yard shell buckets for the Brooklyn navy yard. The government recently placed with the Cleveland Crane & Engineering Co. a contract for five overhead traveling cranes, ranging from five to 100 tons, for the Washington navy yard. The Cleveland company also is reported to have received a contract for two 50-ton overhead traveling cranes from the Federal Shipbuilding Co., which were included in the list of 11 cranes recently awarded. The remaining nine are reported to have been allotted to the Erie Steel Construction Co., and the Milwaukee Electric Crane & Mfg. Co. The contract of the American International Shipbuilding Corp., involving 28 cranes, which

Supremacy

It takes more than Capital, more than Determination, more than Aggressiveness, more than Advertising to make a new product leader of its kind inside of three years.

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The Hamill-Hickox Company, District Representatives.

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Philadelphia Office: 603 Widener Building.
Frank Wallace, District Sales Mgr.

J. E. Dockendorff & Co., 20 Broad Street, New York.
General Export Agents.

was reported last week as being placed, went to the Ohio Locomotive Crane Co., Bucyrus, O., and the Industrial Works, Bay City, Mich., the former receiving 20 of the number required. The Portland Co., Portland, Me., which is erecting an addition to its machine shop for the handling of a new munition contract, has placed an order for a 15-ton overhead traveling crane.

Crane Builders Wait for Materials

Difficulties experienced in obtaining coal, coke and sand are serious as affecting crane builders in Cleveland. Many orders for charging cranes, manipulators, etc., are being filled, however, and the existing gas shortage in many directions has brought a number of orders for gas producers. Orders for special charging cranes from the Utah Iron & Steel Co., Salt Lake City, Utah; the Union Carbide Co., Niagara Falls, N. Y.; the Sargent Forge Co., Buffalo, and the Erie Forge Co., Erie, Pa., have been recently received by the Wellman-Seaver-Morgan Co., Cleveland.

Effect of Government's Tool Inquiry May Be Great

SOME apprehension exists among machine tool dealers in Cleveland as to the effect of the government's recent inquiry for machine tools, which was sent direct to builders. This government appeal may cut seriously into dealers' business, by acting as a deterring influence in the matter of deliveries and by diminishing further inquiry from manufacturers of nonessential products. Builders of automobiles, except those engaged on government work, are inactive at the present time and these latter are for the most part buying only to replace worn equipment. The contract for Rolls-Royce aviation motors which was awarded to the Stearns Motor Car Co., Cleveland, is being distributed in part by the Stearns company among many of the smaller shops of that city. The Studebaker Corp., South Bend, Ind., purchased equipment valued at $75,000 during the past week, consisting mostly of miscellaneous tools. The Morgan Engineering Co., Alliance, O., is buying heavy machinery. Owing to the difficulty which the company is experiencing in securing this type of machinery, it is thought that the government may find it necessary to resort to much commandeering. The American Multigraph Co., Cleveland, it is said, is negotiating for further war work. The Brierly Machine Co., Cleveland, will begin the production of airplane motor parts soon, a contract having recently been secured.

Transportation Now Troubles Builders

IN THE Pittsburgh district some builders are taking orders for machinery and machine tools with the understanding that deliveries are subject to the transportation situation. Railroad embargoes and congestion of traffic have made it impossible for manufacturers to make shipments at any specified time for domestic consumers and on account of this contingency it has been found necessary to put a clause in contracts relieving themselves of responsibility as to the time of delivery. There is considerable foreign inquiry being made for metal-working machinery, but makers are not taking much interest in this business because of the difficulty if not impossibility of shipping abroad. Among the countries seeking this class of equipment are Spain, Italy and France.

Market Recovers After Temporary Depression

ALTHOUGH some dealers in machine tools in the Chicago market find that business has been affected considerably by lack of transportation and difficulties of operation due to lack of fuel and railroad embargoes, there seems to be a fair volume of business from various sources. Users of machine tool equipment are in the market more actively than during the early part of January and sales are being made steadily, especially of equipment which can be furnished promptly. Indications are that considerable contracts have been placed in this vicinity recently for screw machine products, fuses and other small parts of shells. The Buda Co. has issued a third list for additional machine shop equipment; the two preceding lists are still pending. The Standard Steel Car Co., which is preparing to manufacture war materials at Hammond, Ind., has issued a further list calling for general equipment. The Otis Elevator Co., Chicago, is preparing to manufacture rifle parts.

New Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Factories

AUGUSTA, ME.—The Western Motor Car Co. has been incorporated to make motor vehicles with $150,000 capital by E. M. Leavitt and Ernest L. McLean.

BATH, ME.—The Hyde Windlass Co. has let the contract for a brick, 1-story, 50 x 100-foot foundry building on Federal street.

BOOTHBAY HARBOR, ME.—The West Boothbay Harbor Shipbuilding Co. has been incorporated with $100,000 capital by L. A. Dunton, W. H. Reed and H. Chandler Reed.

PORTLAND, ME.—The American Oil & Graphite Co. has been incorporated to mill and smelt metals, minerals, etc., with $500,000 capital. Benjamin G. Ward and Frank N. Kazar are interested.

MANCHESTER, N. H.—The Lacene Mfg. Co., 671 Elm street, has obtained a permit to alter and enlarge a building to be equipped as a machine shop.

BOSTON.—The E. T. Ryan Iron Works, Inc., has been incorporated with $10,000 capital by Guy L. Harden, Adolf A. Lederhas, Cambridge, Mass., and H. Loewenberg.

BOSTON.—The Heath Grate Bar Co. has been incorporated with $10,000 capital by D. W. Allen, E. Roy Blaisdell, Watertown, Mass., and W. A. Chandler.

BURRAGE, MASS.—The Wheeler Reflector Co. has let the contract for a concrete block, 1-story, 50 x 55-foot addition to its factory.

GARDNER, MASS.—The Chair-Town Mfg. Co. has been incorporated to do a foundry, and machine shop business, with $25,000 capital. W. P. Shuffleton, Frank M. Favor and C. H. Hedstrom are incorporators.

GLOUCESTER, MASS.—The Mead-Morrison Mfg. Co., Boston, has let the contract to the New England Structural Co., Boston, for a steel frame and galvanized iron, 1-story, 84 x 240-foot forge shop to be built here.

LAWRENCE, MASS.—The Lenane Supply Co., Inc., has been incorporated as a maker of hardware, mill supplies, auto sundries, etc., with $25,000 capital by Frank E. Lenane, Daniel J. Lenane and H. V. Lenane.

NEWTON, MASS.—Bids close Jan. 25 for a reinforced concrete, 4-story, 80 x 200-foot

COAL TALKS WITH ROLLING MILL JIM

Don't get the blues, fellows, over this coal shut-down. If you've got Hubbard Rolls in the mill you can roll enough in the five days anyway.

So long,

Rolling Mill Jim.—

Hubbard Steel Foundry Co.

EAST CHICAGO, IND.

All Kinds of Iron and Steel Rolls and Steel Castings.

Say you saw it in THE IRON TRADE REVIEW

mill for the Shepherd Worsted Mills on California street.

PALMER, MASS.—The Wright Wire Co. has awarded the contract for the erection of a gas producer house and coal bunker to the Eastern Bridge Construction Co., 38 Crescent street, Worcester, Mass.

SOUTH BOSTON.—Bids will be received in a month for the erection of a $500,000 addition to the plant of the Gillette Safety Razor Co., 41 West First street. The proposed structure will be seven stories high, 300 x 375 feet. Charles T. Main, 201 Devonshire street, Boston, is engineer.

SPRINGFIELD, MASS.—E. J. Fleming, 164 Birnie avenue, has awarded the contract for a 2-story addition to his iron foundry, to cost about $6000.

SPRINGFIELD, MASS.—The Liberty Ignition Co. has purchased a factory at 10 Hayden street which it will equip for the manufacture of spark plugs and automobile specialties.

WALTHAM, MASS.—The Kampe-Robbins Co. has been incorporated to make jeweler's tools, supplies, etc., with $10,000 capital. Michael J. Lampert, Albert F. Robbins and J. E. Kampe are interested.

WORCESTER, MASS.—The Crompton & Knowles Loom Works has let the contract for a brick and steel, 1-story, 23 x 112-foot addition to its storage building and a brick, 1-story, 14 x 28-foot cinder mill and pit.

PAWTUCKET, R. I.—The Lebanon Mills Co. has let the contract for a mill construction, 3-story, 40 x 90-foot storehouse on Exchange street.

PROVIDENCE, R. I.—The plant of the Providence Dye Works, making munitions, was damaged by fire Jan. 18. Government machinery stored in a nearby plant was saved but the plant loss is estimated at $35,000.

PROVIDENCE, R. I.—The Patton-MacGuyer Co. has been incorporated to deal in metal products with $100,000 capital by Ralph C. Patton, Herman F. MacGuyer and Chas. R. Easton.

PROVIDENCE, R. I.—Plans are being drawn for a $25,000 addition to the factory of G. Del Rossi, 240 India street. One of the proposed buildings will be five stories, 49 x 79 feet, while the other will be one story high, 37 x 39 feet.

PROVIDENCE, R. I.—Contract for the construction of a $1,500,000 coal gas plant has been awarded by the Providence Gas Co. to the H. Koppers Co., Pittsburgh.

BRIDGEPORT, CONN.—The McCathron Boiler Works Co. has increased its capital from $5000 to $50,000 to provide for extensions to its plant.

FARMINGTON, CONN. — The Johnson-Campion Mfg. Co. has been incorporated to make machinery with $10,000 capital. Charles Johnson, John P. Campion and Frank Daily are interested.

HARTFORD, CONN.—The S. K. F. Ball Bearing Co. has awarded to the J. H. Crozier Co., 721 Main street, contract for the erection of a $100,000 plant addition, one and two stories.

HIGHWOOD, CONN. — The Rockwell-Marlin Corp. has let a contract to Fred T. Ley & Co., Inc., Springfield, Mass., for a 150 x 400-foot addition to the plant of the Mayo Radiator Co., to cost $3,000,000, including equipment. It will be used as a munitions plant.

TORRINGTON, CONN. — The Fitzgerald Mfg. Co. has increased its capital from $100,000 to $250,000 to provide for manufacture of hardware specialties.

WATERBURY, CONN.—The Scovill Mfg. Co., C. P. Goss, president and treasurer, has let to the Turner Construction Co., 242 Madison avenue, New York, contract for the construction of a $200,000 plant addition. The proposed building will be five stories, 70 x 218 feet, with ell, 20 x 73 feet.

WEST HARTFORD, CONN.—The Whitlock Coil Pipe Co. has increased its capital from $100,000 to $150,000 to provide for extensions.

Along the Middle Atlantic Seaboard

BROOKLYN, N. Y.—The Gregory-Bibbs Ordnance Co. has been chartered with $30,000 capital to manufacture fire-arms. The incorporators include E. Begni, J. Weil and Z. M. Delman, 126 Avenue C, New York.

BROOKLYN, N. Y.—Architects Shampan & Shampan, 772 Broadway, are drawing plans for an $8000 addition to the plant of Charles J. Obermeyer.

BROOKLYN, N. Y.—A $60,000 storage building extension will be erected here by Lehn & Fink, 120 William street, New York. Dushman & Kahn, 30 East Forty-second street, New York, are architects.

BUFFALO.—The Buffalo Forge Co., 490 Broadway, manufacturer of forges, fans, blowers, etc., has had plans prepared for a 2-story plant addition to be built at 493 Spring street.

BUFFALO.—F. N. Treevor plans to build a machine shop on Brace street.

BUFFALO.—The R. Ivey Co. has been organized by F. K. and E. F. Schutrum to engage in a business as machinist. The company is capitalized at $35,000.

DUNKIRK, N. Y.—The Chautauqua Wire Corp., maker of rods for precision drills, has leased the buildings formerly occupied by the Dunkirk Development Co., on Lucas avenue, which it will equip for the manufacture of its product. The company plans to spend about $250,000 in melting furnaces, rolling mills and hammers. The company has recently been organized with $250,000 capital.

FAIRPORT, N. Y.—A charter of incorporation has been granted to the Trescott Co., Inc., capitalized at $100,000. The company will manufacture agricultural machinery. Incorporators include W. A. Trescott, E. L. Trescott, and A. N. Leclear.

FRANKFORT, N. Y. — The Pratt Chuck Co., Main street, manufacturer of lathe chucks, has increased its capital from $550,000 to $950,000 to provide for enlarging its plant and installing additional equipment.

JAMESTOWN, N. Y.—The plant of the Curtis Machine Corp., 1300 East Second street, has been damaged by fire Jan. 2 with a loss of $50,000 to building and machinery.

JAMESTOWN, N. Y. — The Gurney Ball Bearing Co., 402 Chandler building, has awarded the contract for a 1-story, 20 x 256-foot addition to its plant. Cost is estimated at $20,000.

LONG ISLAND CITY, N. Y.—The Willard F. Meyers Machine Co., Hamilton avenue, has completed plans for a 1-story plant addition, 35 x 75 feet, to cost $7000.

NEW YORK.—Steven Ranson, marine repair, will erect a 5-story addition, 20 x 87 feet, to his new 4-story plant at 408-10 West street. Wharton Greene & Co. are in charge of the construction.

NEW YORK.—Plans are being drawn for a $50,000 warehouse for Edward Caterson, 17 Battery place. The proposed building will be 1-story high, 50 x 75 feet. Beverly S. King and S. Campbell, 103 Park avenue, are architects.

NIAGARA FALLS, N. Y.—The Elderfield-Hartshorn Hardware Co., 40 Falls street, has awarded a contract for a 2-story addition to be built on First street. The structure will be 50 x 100 feet, and will cost $25,000. The company manufactures hardware and sheet metal products.

ROCHESTER, N. Y.—The Atlantic Stamping Co., 180 Ames street, has awarded the contract for a 1-story addition to its plant for the manufacture of sheet metal products. Cost is estimated at $21,000.

ROCHESTER, N. Y.—The Selden Motor Vehicle Co., Probert street and East avenue, has awarded contract for a 2-story, 160 x 200-foot addition to its factory, to cost $100,000.

SYRACUSE, N. Y. — The Smith Wheel Co., Inc., 101 North Geddes avenue, manufacturer of automobile wheels, has increased its capital from $1,000,000 to $3,000,000 and will build a number of additions to its plant.

CLIFFTON HEIGHTS, PA. — The Kent Mfg. Co. will build a $50,000 power plant, 1-story high, 40 x 67 feet. F. E. Hahn, 1112 Chestnut street, Philadelphia, is architect and engineer.

HANOVER, PA. — The Bethlehem Steel Corp., First National Bank building, Pittsburgh, has purchased the Bittinger Stone Quarries and will install considerable new machinery and equipment.

HARRISBURG, PA. — The Harrisburg Pipe & Pipe Bending Co. has awarded the general contract for a $45,000, 1-story plant addition to Jos. Pomeraining, Kunkel building. This building will replace the one damaged by fire recently.

McKEESPORT, PA.—The National Tube Co., Frick building, Pittsburgh, has awarded the contract for a 1-story, 150 x 240-foot factory to cost $100,000.

MODENA, PA.—Bids were received Jan. 21 for a $15,000 plant addition for the Gerson Paper Stock Mill Co. L. Z. Slawter, Coatesville, Pa., is architect.

NORRISTOWN, PA. — The Summerhill Tubing Co., West Fourth street, is building an addition to its plant.

PHILADELPHIA.—It is reported that bids have been received for the erection of a warehouse at 235 Dock street for L. B. Fortner, 36 Strawberry street. Peuckert & Wunder, 310 Chestnut street, are architects and engineers.

PHILADELPHIA.—The plant of John M. Melloy's Sons, manufacturer of sheet steel products, 1419 Spring Garden street, has

Farrell Quality Small Steel Castings

Increase the factors of ***safety*** and ***durability*** in the construction of your Trucks, Tractors or Machine Tools by using castings which are especially made to withstand unusual strains or vibrations.

The wonderful fatigue resisting qualities of ***Farrell-Cheek Steel Castings*** will build up a reputation for *reliability* for your products which money could never buy.

Let us figure on your requirements.

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Blank Gears, Carbonizing Boxes and **Case Hardening Boxes.**

Farrell-Cheek Steel Foundry Co.

SANDUSKY, OHIO

BRANCH OFFICES

NEW YORK PHILADELPHIA CHICAGO

been damaged by fire with a loss estimated at $50,000.

PITTSBURGH.—The Pittsburgh Crucible Steel Co., Frick building, has increased its capital to $5,000,000 and plans to enlarge its plant.

SOUTH BETHLEHEM, PA.—Fire caused by a defective electric connection damaged the gun forging heat treating plant of the Bethlehem Steel Co. Jan. 6. The loss sustained was about $10,000.

CAMDEN, N. J.—W. Webster & Co., manufacturer of stoves, heaters, etc., has increased its capital from $150,000 to $450,000 to provide for the erection of an addition to its plant.

CAMDEN, N. J.—The Austin Co., Bulletin building, Philadelphia, will erect a 1-story, brick and steel, 35 x 300-foot building for the New York Shipbuilding Co.

EAST ORANGE, N. J.—The A. P. Smith Mfg. Co., Norman street, manufacturer of water works machinery, has increased its capital from $600,000 to $1,000,000 to provide for plant expansion.

IRVINGTON, N. J.—The Reliable Tool Co., recently incorporated with $125,000 capital, plans to build a plant. C. Katzan is in charge.

JERSEY CITY, N. J.—The Snead Iron Works, 66-112 Pine street, is having plans drawn for a $16,000 plant addition, one story high 82 x 102 feet. The Guaranty Construction Co., 140 Cedar street, New York, is in charge.

NEWARK, N. J.—The Universal Compound Co., Mott street and Passaic avenue, will make extensions to its 4-story factory, to cost $6000.

NEWARK, N. J.—Work will start shortly on the construction of a $12,000 addition to the plant of the Butterworth-Judson Corp., 61 Broadway, New York City. The new addition will be two stories high, 58 x 103 feet. The company manufactures chemicals.

PASSAIC, N. J.—The Standard Wire Co. has been incorporated with $50,000 capital by J. W. Laffer, H. J. Laffer and L. E. Laffer, Patterson, N. J.

PATERSON, N. J.—P. Van Kirk, 85 Fulton street, has been awarded the contract for the construction of a 4-story, 60 x 130-foot addition to the mill of the Henry Doherty Silk Co.

PERTH AMBOY, N. J. — The government has let the contract for a shell loading plant to be built on a site of 1300 acres. Cost of the construction is estimated at $3,000,000.

POMPTON LAKES, N. J.—The E. I. du Pont de Nemours Co. has purchased a tract of ground for the extension of its plant.

BALTIMORE.—Contract for the construction of a $15,000 coal trestle has been awarded to the Price Construction Co., Maryland Trust building, by the Western Maryland Realty Co.

BALTIMORE.—The National Enameling & Stamping Co. has let the general contract for the erection of a $12,000 plant addition, 1-story, 31 x 71 feet, to the John Waters Building Co., 23 East Center street.

CURTIS BAY, MD.—The Austin Co., Bulletin building, Philadelphia, has received the general contract for erecting three plant additions, costing in all $100,000, for the Industrial Alcohol Co.

RICHMOND, VA.—The Richmond, Fredericksburg & Potomac railroad is having plans prepared for an addition to its engine house, to cost $20,000. W. D. Duke is general superintendent.

Activities in the Central States

APPLETON, WIS. — The Reliance Motor Truck Co. will award contracts for the erection of its new manufacturing plant about Jan. 28 and will break ground early in February. The first building will be 76 x 320 feet to contain a machine shop and assembling room. The company is now manufacturing trucks at Racine, Wis. Charles H. Piggins is vice president and general manager.

CLINTONVILLE, WIS. — The Topp-Stewart Tractor Co. has awarded the general contract to the C. R. Meyer & Sons Co., Oshkosh, Wis., for erecting a concrete dam and power house on the Embarrass river. An 800-horsepower hydro-electric installation is planned.

LA CROSSE, WIS.—Articles of incorporation have been filed by the McKenzie Mfg. Co. The capital stock is $25,000 and the incorporators are Charles E. Bentley, Ralph E. McKenzie and V. A. Bentley. The company will engage in the manufacture of farm implements.

LAKE GENEVA, WIS. — F. A. Briegel, city clerk, is taking sealed bids until Feb. 1 for the construction of a concrete bridge costing about $15,000 at the foot of Broad street.

MILWAUKEE.—The American Oil Motors Co. is being organized with $1,000,000 capital by A. C. Lingelbach, 309 Caswell block, to manufacture automobile truck and airplane engines.

MILWAUKEE.—The capital stock of the Clum Mfg. Co., 23-25 Erie street, maker of electrical and automobile specialties, has been increased from $50,000 to $100,000 to provide for plant expansion.

MILWAUKEE. — The Simplex Machinery & Tool Co. has been incorporated with $75,000 capital by Paul D. Durant and H. F. Friedrich, and will establish a plant to manufacture metal-working machinery.

RACINE, WIS.—The Hamilton & Beach Mfg. Co., manufacturer of electric motors, will build a 3-story addition 80 x 150 feet in size, to cost $80,000.

SHEBOYGAN, WIS.—Klug & Smith, Mack block, Milwaukee, consulting engineers, have been commissioned by the common council to prepare plans for the proposed new Fourteenth street bridge. Bids will not be asked before summer.

VESPER, WIS.—The Vesper Iron Works, which has been idle for about three years, is about to reopen for the production of malleable castings.

DETROIT.—The Lloyd Mfg. Co., Menominee, Mich., manufacturer of machinery, has increased its capital from $400,000 to $1,000,000 to provide for building a factory here. M. B. Lloyd is general manager of the company.

DETROIT.—The Russell Wheel & Foundry Co. plans to build a 1-story factory costing $75,000. John Russell, Chene street, and Belt Line railroad, is secretary.

PORT HURON, MICH. — The American Machine Corp. has increased its capital from $10,000 to $200,000 to provide for extensions to its plant.

BELLEVILLE, ILL.—The United States Smelting Furnace Co. has been incorporated with capital of $50,000 to manufacture smelting and melting furnaces and to smelt and melt ore and metals of all kinds.

BLUE ISLAND, ILL.—The American Wire Fabric Co., 208 South La Salle street, Chicago, will build a plant here, to cost $150,000.

CHICAGO.—L. Sparks, 320 West Grand avenue, will build a foundry 50 x 125 feet in size at 1723 Carroll avenue, to cost $5000.

CHICAGO.—Steffenson Bros., 5331 Warner avenue, automobile parts and screw machine products, will re-establish their business, having sold their former plant.

DUNDEE, ILL.—Bids will be received until Jan. 30 by the village clerk for a reinforced concrete bridge across Fox river at Main street. George W. Lamb, Geneva, Ill., is superintendent of highways.

KINCAID, ILL. — The Railway & Mine Supply Co., 332 South Michigan avenue, Chicago, has awarded contract for a $75,000 factory to be erected here.

ANDERSON, IND. — The Laurel Motors Co. will equip a factory to manufacture automobile cylinder heads.

HAMMOND, IND.—The United Boiler & Foundry Co., 185 Wilcox avenue, is building a plant 75 x 100 feet in size, to cost $5000.

INDIANAPOLIS. — The Victor Screw Works has been chartered with $50,000 capital by Roy C. Allshouse, E. C. Miller and H. G. Power.

AKRON, O.—The Bridgewater Machine Co. has awarded the general contract to the Carmichael Construction Co., Hamilton building, for a foundry addition to cost $60,000.

ALLIANCE, O.—A charter of incorporation has been granted to the Alliance Controller Co., organized with $10,000 capital by S. D. Lane, T. C. Uran, C. A. Lane and J. D. Brown.

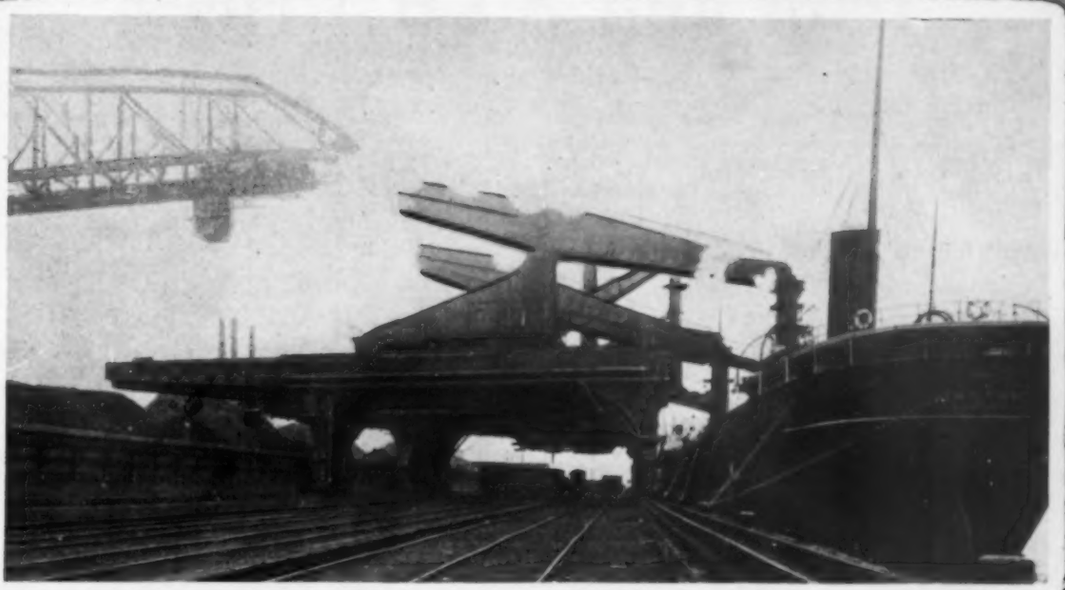
BELLEFONTAINE, O.—The stone crusher plant of Frank Irwin and Roy Wood on East Liberty street has been seriously damaged by fire and will be rebuilt.

CANTON, O.—A charter of incorporation has been granted to the Canton Chaplet & Mfg. Co., capitalized at $10,000. The incorporators are A. R. Turnbull and G. S. Shaeffer.

CINCINNATI.—Bids are being received by Harry Hake, architect, for the construction of an addition to the plant of the Cisco Machine Tool Co., Elmore street, Northside. Plans call for a building 59 x 121 feet in size.

CLEVELAND.—Plans have been filed by Christian, Schwarzenberg & Gaede, engineers, 1900 Euclid avenue, for a 1-story foundry building, 90 x 100 feet in size, to be erected by the Monarch Brass Co., 4613 Payne avenue. Contract for the construction work has been awarded to the Sam W. Emerson Co., 1900 Euclid avenue.

EUCLID, O.—The Anchor Post Iron Works, Newark, N. J., has purchased a site of six acres on Bliss road and proposes to build a factory for the manufacture of iron fence.



Steel Giants Do Work of Thousands of Men

All of the large modern ore docks constructed during the last six years have been equipped with **Hulett Boat Unloaders.** These machines have become a standard for unloading Iron Ore, and ***they are equally well adapted for unloading Coal.***

Hulett Unloaders are built in the following sizes and guaranteed capacities: **For Ore:** *17 Ton Buckets,* capacity 1,250,000 tons per season; *15 Ton Buckets,* capacity 1,000,000 tons per season; *10 Ton Buckets,* capacity 750,000 tons per season. **For Coal:** *8 Ton Buckets,* capacity 500,000 tons per season.

Hulett Unloaders require (1) fewest number of men, (2) lowest labor cost per ton, (3) lowest power cost per ton, (4) lowest maintenance cost per ton.

Complete Ore and Coal Handling Stations, equipped with Boat Unloaders, Car Dumpers, Rehandling Bridges, etc., are a specialty of The W-S-M Company.

Bulletins are in preparation on Ore and Coal Handling Machinery. *Send for your copies.*

The four Unloaders pictured above constitute the Pennsylvania Railway's Whisky Island installation at Cleveland, Ohio.

Principal Products of The W-S-M Company

Steel Plant Equipment: Manipulators, Furnaces, Charging Machines, etc.
By-Product Coke Oven Machinery.
Shipyard Cranes.
Hoisting and Mining Machinery.
Ore and Coal Handling Machinery.
Special Large Cranes.
Gas Producers, Gas Valves.
Hydraulic Turbines.
Johnson Hydraulic Valves.
Steel Castings.

WELLMAN SEAVER MORGAN COMPANY
CLEVELAND
OHIO U.S.A.

Say you saw it in THE IRON TRADE REVIEW

Iron and Steel Prices

Corrected to Tuesday Noon

IRON ORE

Superior Ores, Per Ton, Lower Lake Ports.	
Old range Bessemer, 55 iron	$5.95
Mesabi Bessemer, 55 iron	5.70
Old range non-Bess., 51½ iron	5.20
Mesabi non-Bess., 51½ iron	5.05

WAREHOUSE PRICES

Steel bars, Chicago	4.10c
Steel bars, Cleveland	4.035c
Steel bars, Detroit	4.085c
Steel bars, Philadelphia	4.10c
Steel bars, New York	4.095c
Steel bars, St. Louis	4.17c
Steel bars, Cincinnati	4.085c
Steel bars, St. Paul	4.22c
Steel bars, Buffalo	4.05c
Iron bars, Buffalo	4.65c
Iron bars, Chicago	4.10c
Iron bars, Cleveland	3.985c
Iron bars, Detroit	4.75c
Iron bars, St. Louis	4.17c
Iron bars, Cincinnati	4.085c
Iron bars, Philadelphia	4.50c
Iron bars, New York	4.659c
Shapes, Chicago	4.20c
Shapes, Detroit	4.185c
Shapes, St. Louis	4.27c
Shapes, St. Paul	4.32c
Shapes, New York	4.195c
Shapes, Cleveland	4.135c
Shapes, Philadelphia	4.20c
Shapes, Buffalo	4.15c
Shapes, Cincinnati	4.185c
Plates, Buffalo	4.40c
Plates, Chicago	4.45c
Plates, Detroit	4.435c
Plates, St. Louis	4.52c
Plates, St. Paul	4.57c
Plates, New York	4.445c
Plates, Cleveland	4.385c
Plates, Philadelphia	4.45c
Plates, Cincinnati	4.435c
No. 10 blue anl. sheets, Chi.	5.45c
No. 10 blue anl. sheets, Cleve.	5.385c
No. 10 blue anl., Buffalo	5.40c
No. 10 blue anl., sheets, St. L.	5.52c
No. 10 blue anl. sheets, Cinci.	5.435c
No. 10 blue anl. sheets, St. Paul	5.57c
No. 10 blue anl. sh., Detroit	5.435c
No. 28 black sheets, Chgo.	6.45c
No. 28 black sheets, Cleve.	6.35c
No. 28 black sheets, Cinci.	5.45c
No. 28 black, Detroit	6.435c
No. 28 black sheets, St. L.	6.52c
No. 28 black sheets, St. Paul	6.57c
No. 28 galv. sheets, Chgo.	7.70c
No. 28 galv. sheets, Cleve.	7.60c
No. 28 galv. sheets, Cinci.	6.635c
No. 28 galvanized, Detroit	7.685c
No. 28 galv. sheets, St. L.	7.77c
Hoops, Cleveland	4.885c
Hoops, Detroit	4.935c

IRON AND STEEL SCRAP

STEEL WORKS USE
(Gross Tons)

Bundled sheets, Pittsburgh	**$22.00 to 23.00**
Bundled sheets, Cleveland	24.50 to 25.25
Bundled sheets, Buffalo	22.00 to 24.00
City wrought, short, N. Y.	26.00 to 26.50
Frogs, switches, guards, St. L.	30.00 to 31.00
Frogs, switches, guards, Chgo.	30.00
Heavy melting steel, Pitts.	30.00
Heavy melting steel, Buffalo	30.00
Heavy melting steel, Chgo.	**30.00**
Heavy melt'g steel, Cleveland	30.00
Heavy melting steel, Cinci.	**27.00 to 27.50**
Heavy melting steel, east. Pa.	30.00
Heavy melting steel, N. Y.	29.50 to 30.00
Heavy melting steel, St. L.	29.00 to 29.25
Heavy melting steel, Birming.	23.00 to 24.00
Hydraulic press. sheets, Cleve.	28.50 to 29.50
Hydraulic press. sheets, Pitts.	27.00 to 28.00
Hydraulic press. sheets, Chgo.	27.00 to 27.50
Low phos. steel, Buffalo	40.00
Low phos. steel, Pittsburgh	40.00
Low phos. steel, eastern Pa.	40.00
Shoveling steel, Chicago	**30.00**
Shoveling steel, St. Louis	27.50 to 28.00
Steel rails, short, Chicago	34.00 to 34.50
Steel rails, short, Cleveland	32.00 to 33.00
Steel rails, short, St. Louis	36.50 to 37.00
Steel rails, old, Birmingham	28.00 to 30.00
Stove plate, Cincinnati	19.00 to 19.50
Stove plate, St. Louis	20.50 to 21.00
Stove plate, N. J. points	21.50
Stove plate, Birmingham	19.50 to 21.50
Stove plate, Buffalo	25.00
Stove plate, eastern Pa.	23.50 to 24.50
Stove plate, Cleveland	21.00 to 22.00
Stove plate, Pittsburgh	**20.00 to 21.00**
Cast iron borings	11.00 to 12.00

(Net Tons)

Boiler plate, cut, No. 1, Chgo.	$22.00 to 23.00
Boiler plate, cut, No. 1, St. L.	22.50 to 23.00
Bundled sheets, Cincinnati	17.00 to 17.50
Knuckles, coup., Chicago	34.00 to 34.50
Knuckles, coup., St. Louis	31.50 to 32.00
Springs, Chicago	39.50 to 40.00
Stove plate, Chicago	22.00 to 23.00

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$0.95
Newark, N. J.	3.50
Boston	3.70
Philadelphia	3.30
Pittsburgh	.95
St. Louis	3.18
Minneapolis, St. Paul	4.54
Buffalo to:	
Albany, N. Y.	$1.26
New England (rail)	3.10
New York and Brooklyn (rail)	3.10
Virginia furnaces to:	
Philadelphia	$3.27
New England	3.77
Brooklyn, Jersey City, Newark	3.52
Birmingham, Ala., to:	
Boston	6.00
Cincinnati	2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky.	2.65
Minneapolis, St. Paul	5.85
New York (r. and w.)	6.00
Philadelphia (r. and w.)	5.25
Pittsburgh	4.90
Savannah, Ga.	2.75
St. Louis	3.40
Chicago to:	
Des Moines	$2.80
Milwaukee	.50
Minneapolis, St. Paul	2.00
Moline, Ill.	1.15
Omaha	3.58
St. Louis	1.58
Ironton and Jackson, O., to:	
Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58
Minneapolis, St. Paul	4.54
Duluth, Minn., to:	
Minneapolis-St. Paul	$1.25
Mayville, Wis.:	
Minneapolis-St. Paul	$1.75

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	19.5 cents
Philadelphia	18.5 cents
Boston	21.5 cents
Buffalo	16.0 cents
Baltimore	18.0 cents
Cleveland	13.5 cents
Cincinnati	17.0 cents
Chicago	21.5 cents
Detroit	15.7 cents
Minneapolis and St. Paul	32.9 cents
Denver	79.0 cents
St. Louis	27 cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast (all rail)	75 cents
Pacific coast (tin plate)	75 cents

IRON MILL USE
(Gross Tons)

Busheling, No. 1, Cleveland	29.00 to 30.00
Busheling, No. 1, Buffalo	30.00
Busheling, No. 2, Buffalo	22.00 to 24.00
Busheling, No. 1, Pittsburgh	**21.00 to 22.00**
Cast borings, New York	17.50
Cast borings, eastern Pa.	19.00 to 20.00
Cast borings, Cleveland	20.00
Cast borings, Buffalo	19.00 to 20.00
Cast borings, Pittsburgh	20.00
Cast borings, Birmingham	13.00 to 15.00
Cast borings, Chgo.	19.00 to 19.50
City wrought, long, N. Y.	31.00 to 32.00
Cut forge, Chicago	34.50 to 35.00
Forge flashings, small, Cleve.	26.50 to 27.00
Forge flashings, large, Cleve.	27.50 to 28.00
Forge No. 1, Eastern Pa.	24.00 to 25.00
Grate bars, Buffalo	25.00
Grate bars, Cleveland	21.50 to 22.50
Grate bars, N. J. points	21.50
Iron axles, Pittsburgh	42.00 to 44.00
Iron axles, Cincinnati	42.00 to 42.50
Iron axles, Cleveland	47.50
Iron axles, eastern Pa.	47.50
Iron axles, Chicago	47.50
Iron axles, Buffalo	45.00 to 47.00
Iron rails, Chicago	39.00 to 40.00
Iron rails, Buffalo	37.00 to 38.00
Iron rails, Cincinnati	32.00 to 32.50
Iron rails, St. Louis	34.00 to 35.00
Iron rails, Cleveland	35.00
Machine turnings, Cleve.	20.00
Machine turnings, Buffalo	18.00 to 18.50
Machine turnings, N. Y.	16.00 to 16.50
Machine turnings, Pitts.	20.00
Machine turnings, east. Pa.	18.50 to 19.50
Machine turnings, Birming.	17.00 to 18.00
Machine turnings, Chgo.	19.00 to 19.50
Pipes and flues, Cleveland	25.50 to 26.50
R. R. mch. cast, No. 1, Buff.	30.00
R. R. wrgt. No. 1, Buffalo	35.00
R. R. wrgt., No. 1, east, Pa.	35.00
Railroad wrgt., No. 1, Cleve.	35.00
R. R. wrought, No. 1, Pitts.	35.00
Railroad wr'ght, No. 1, Chgo.	35.00
Railroad wr'ght, No. 2, Chgo.	34.50 to 35.00
R. R. wrgt. No. 1, Birming.	28.00 to 32.00
Wrought pipe, Buffalo	29.00
Wrought pipe, eastern Pa.	30.00 to 32.00
Wrought pipe, New York	31.00

(Net Tons)

Angle bars, iron, Chicago	$38.00 to 38.50
Angle bars, steel, St. Louis	31.50 to 32.00
Arch bars & transoms, St. L.	42.00 to 42.50
Arch bars & transoms, Chgo.	39.00 to 40.00
Busheling, No. 1, Chicago	26.00 to 27.00
Busheling, No. 1, Cincinnati	24.00 to 24.50
Busheling, No. 1, St. Louis	25.50 to 26.00
Busheling, No. 2, Chicago	18.00 to 19.00
Cast borings, Cincinnati	13.00 to 13.50
Cast borings, St. Louis	16.00 to 16.50
Iron axles, St. Louis	45.00 to 45.50
Iron axles, Chicago	47.00 to 48.00
Machine turnings, Cinci.	13.00 to 13.50
Machine turnings, St. L.	17.25 to 17.75
Pipes and flues, Chicago	24.00 to 25.00
Pipes and flues, St. Louis	24.50 to 25.00
Railroad wrgt., No. 1, Cinci.	30.00 to 30.50
Railroad wrgt., No. 1, St. L.	31.00 to 31.25
Railroad wrgt., No. 2, St. L.	30.50 to 31.00

IRON OR STEEL WORKS USE
(Gross Tons)

Axle turnings, Cleveland	$24.00 to 25.00
Axle turnings, Buffalo	26.50 to 27.00
Shafting, New York	37.50 to 38.00
Shafting, eastern Pa.	45.00 to 47.50
Steel car axles, Birmingham	32.00 to 33.00
Steel car axles, New York	45.50 to 46.00
Steel car axles, Buffalo	45.00 to 47.00
Steel car axles, Cleveland	45.00
Steel car axles, Pittsburgh	**40.00 to 42.00**
Steel car axles, eastern Pa.	47.50
Steel car axles, Chgo.	47.50

(Net Tons)

Shafting, St. Louis	34.50 to 35.00
Steel car axles, St. Louis	43.00 to 43.50

IRON FOUNDRY USE
(Gross Tons)

Car wheels, (iron), Pitts.	$30.00
Car wheels, (steel), Pitts.	**33.00 to 35.00**
Car wheels, eastern Pa.	33.00 to 35.00
Car wheels, Buffalo	30.00
Car wheels, Chicago	30.00
Car wheels, St. Louis	29.50 to 30.00
Car wheels, Birmingham	25.00 to 30.00
Car wheels, Cleveland	30.00
Tram car wheels, Birming.	20.00 to 25.00
Cast, No. 1, Birmingham	25.00 to 27.50
Cast, 1, machy. N. J. points	29.50 to 30.00
Cast No. 1, Cleveland	30.00
Cast, 1, heavy, N. J. points	29.50 to 30.00
Cast, 1, machy., N. J. points	30.00
Cast No. 1 Chgo.	30.00
Cast, No. 1, Pittsburgh	28.00 to 29.00
Malleable railroad, Cincinnati	24.00 to 24.50
Malleable railroad, Cleveland	30.00
Malleable railroad, Buffalo	30.00
Malleable railroad, Pittsburgh	30.00
Malleable railroad, east. Pa.	**30.00 to 32.00**
Malleable railroad Chgo.	30.00
Malleable, agricultural, Chgo.	29.50 to 30.00

(Net Tons)

Cast, No. 1, Cincinnati	26.00 to 26.50
Cast, No. 1, St. Louis	24.50 to 25.00
Malleable railroad, St. Louis	26.25 to 26.75
Malleable agricultural, Chgo.	**24.00 to 25.00**
Malleable agricultural, St. L.	24.50 to 25.00

MISCELLANEOUS USES
(Gross Tons)

Reroll. rails, 5 ft. & ov., Pitts.	$35.00
Reroll. rails, 5 ft. & ov., Chgo.	35.00
Reroll. rails, 5 ft. & ov., E. Pa.	35.00
Reroll. rails, 5 ft. & ov., St. L.	34.00 to 35.00
Reroll. rails, 5 ft. or ov., Cleve.	33.00
Rerolling rails, long, Birming.	**37.50 to 38.50**
Locomotive tires, Chgo.	42.50 to 43.50

(Net Tons)

Boiler punchings, Chicago	31.50 to 32.00
Locomotive tires, St. Louis	33.50 to 34.00